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Population shifts directly affect the bottom line, so the basics of demography are now basic to business as well. Demographics combine demographic data with socioeconomic and geographic factors to help business and other managers know the market for the goods and services they offer. This guide explains market, product, and site analyses, discusses data sources and resources, and includes case studies involving the General Motors Corporation, Bell Atlantic, the Country Mart in Omaha, Nebraska, and Market Statistics, Inc. Post-war population trends have had an enormous impact on consumer and labor markets, bringing home to business the importance of taking advantage of demographic shifts. The baby boom created a 75-million-person "bulge" in U.S. age structure which affected school systems, housing, and the job market. Another shift is that households have been growing more rapidly than the population, with individuals living alone and childless couples contributing much of the growth. Geographic patterns of regional distribution have also altered, with the South and West accounting for most of the U.S. population increase. Advances in computerized access to data describing these changes and increased consciousness of their economic significance have spurred the application of demographic knowledge by managers and the growth of the demographic information industry. This document describes the resources and methods of demographics, including the creation and use of demographic data products. (SM)

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POPULATION BULLETIN
Vol. 43, No. 1, February 1988

Demographics: People and Markets

By Thomas W. Merrick and Stephen J. Tordella

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Abstract—Population shifts directly affect the bottom line, so the basics of demography are now basic to business as well. Demographics combine demographic data with socioeconomic and geographic factors to help business and other managers know the market for the goods and services they offer. This guide explains market, product, and site analyses, discusses data sources and resources, and includes case studies involving the General Motors Corporation, Bell Atlantic, the Country Mart in Omaha, Nebraska, and Market Statistics, Inc.

Post-war population trends have had an enormous impact on consumer and labor markets, bringing home to business the importance of taking advantage of demographic shifts. The baby boom created a 75-million-person "bulge" in U.S. age structure. As the baby-boom generation moves through the life cycle, they have affected school systems, housing, and the job market: other age-sensitive goods and services are now affected by the aging of the population. Job markets are changing as well, now that the baby boomers are entering middle age and the baby-bust cohorts and immigrants are accounting for a larger share of labor force growth. Another shift is that households have been growing more rapidly than the population, with individuals living alone and childless couples contributing much of the growth. Geographic patterns of regional distribution have also altered, with the South and West accounting for most of U.S. population increase.

Advances in computerized access to data describing these changes and increased consciousness of their economic significance has spurred the application of demographic knowledge by managers and the growth of the demographics information industry. This *Bulletin* describes the resources and methods of demographics, including the creation and use of demographic data products.

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Demographics: People and Markets

By Thomas W. Merrick and Stephen J. Tordella

Case Studies by Louis Pol, Dianne Schmidley, Patricia Snider, and Edward Spar

Page

Introduction ... 3
Why Demographics Are Important ... 3
Demographic Trends and the Bottom Line ... 5
  Changing Age Composition ... 8
  Households and Families ... 10
  Changing Population Geography ... 13
  The Changing Work Force ... 17
  International Population Trends ... 19
Benefits of Using Demographics ... 20
The Demographic Analysis Process ... 21
Demographic Data: The Raw Material of Demographics ... 22
  The Commercial Data Industry ... 25
  Geographic Methods ... 26
  Update Methods ... 27
  Geodemographic Systems ... 28
  Retail Potential Measures ... 30
  Site Analysis Process ... 32
  Product Planning ... 33
Who Does Demographics? ... 35
Demographics and Other Management Tools ... 37
What the Future Holds ... 38

Case Studies: Demographic Analysis in a GM Modernization Program ... 39
Payment Agency Placement Strategy ... 41
Determining the Demographics of a Market Area ... 43
Pitfalls and Pratfalls: Hazards in Secondary Data ... 45

References ... 46
Suggested Reading ... 47

Boxes
1. Census Geography ... 24
2. "Cluster" Consumer Targeting ... 29

Tables
1. U.S. Households: 1960, 1970, 1980, 1985 ... 11
2. Labor Force Composition: 1975, 1985, 1995 (projected) ... 18

Figures
1. Family Expenditures as Percent of Average Income, 1917-19 and 1985 ... 4
2. Age Composition of U.S. Population, 1955, 1985, 2015, 2035 ... 6
3. Expenditures on Selected Items by Age, 1985 ... 9
4. Households by Type, 1960 and 1985 ... 12
5. Changing Family Structure: Percent Growth, 1960-1985 ... 13
6. Population Distribution: Regional Percentages, 1960 and 1985 ... 14
7. Regional Shares of U.S. Population Growth, 1960-1985 ... 15
8. Female Participation in Labor Force, 1960-1985 ... 17
9. Labor Force Changes, 1975-85, 1985-95 (projected) ... 19

POPULATION BULLETIN

Vol. 43, No. 1, February 1988

Blue Blood Estates

	What They Like . . .	And Don't Like
Automobiles	Jaguar	Monte Carlo
Investments	Treasury Notes	Christmas Club
Leisure/Sports	Skiing	Pro Wrestling
Package Goods	Frozen Pastry	TV Dinners
Vacation/Travel	Foreign Travel	Camper/Trailer

New Melting Pot

	What They Like . . .	And Don't Like
Automobiles	Mitsubishi	Ford Escort
Investments	Certs. of Deposit	Credit Unions
Leisure/Sports	Horse Racing	Hunting
Package Goods	Yogurt	Pizza Mixes
Vacation/Travel	By Railroad	Cruise Ships

Gray Power

	What They Like . . .	And Don't Like
Automobiles	Cadillac	Subaru
Investments	Discount Brokers	Keogh Account
Leisure/Sports	Power Boats	Skiing
Package Goods	Frozen Entrees	Cake Mixes
Vacation/Travel	Cruise Ship	Rental Cars

Norma Rae-Ville

	What They Like . . .	And Don't Like
Automobiles	Bonneville	Saab
Investments	Personal Loan	Brokerage Account
Leisure/Sports	Roller Derby	Live Theatre
Package Goods	Canned Hash	English Muffins
Vacation/Travel	By Bus	Passports

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Examples of consumer tastes within three PRIZM "clusters" grouping people of similar demographic and socioeconomic characteristics, developed by Claritas.

Demographics: People and Markets

By **Thomas W. Merrick** and **Stephen J. Tordella**

dem-o-graph-ics *n.* (1) *sing.*, application of demographic information and methods in business and public administration. (2) *pl.*, the demographic information utilized in (1).

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The authors wish to thank Sarah Besadny for her assistance.

The word "demographics" wasn't even in the dictionary when most of today's managers learned business and public administration. Yet, as management guru Peter Drucker proclaims, "In the twentieth century, it is sheer folly to disregard demographics."[1] The effective manager today cannot not know and understand how changing demographic trends affect markets for goods and services.

Demographics: management information that helps decision makers identify, and take advantage of, changes in population size, growth, and composition. Population shifts directly affect the bottom line: those who do not take population trends into account risk losing sales, higher costs, and failure to keep up with the competition.

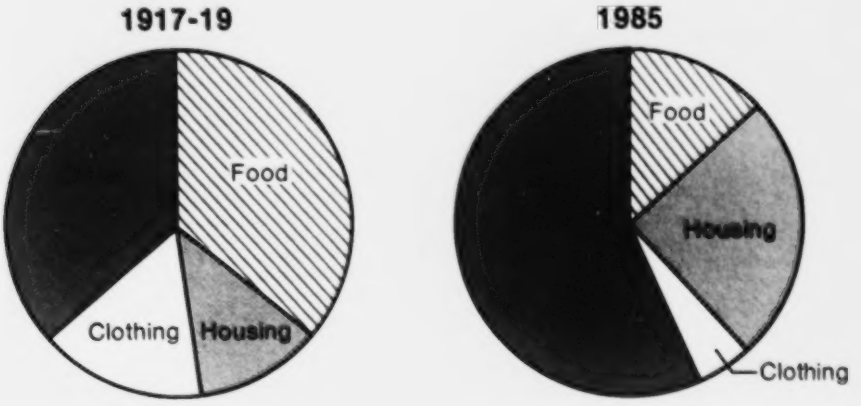
Demographers, statisticians, and other social scientists have been measuring and interpreting population shifts and characteristics for two centuries. Demographers have traditionally devoted a significant part of their work to explaining how demographic variables affect social and economic change, and have played an important role in informing policymakers and planners in population-sensitive areas such as education, health, and pensions. But the rapid growth of applied demography and its connection with business over the past two decades represent an important extension of interest and emphasis, and the appellation "demographics" helps establish a separate identity. Demographics today are at the core of a growing information service industry, including commercial vendors, demographics units in some major corporations, and applied research organizations and consultants.

This *Bulletin* is intended as a guide to the field of demographics, providing a general introduction to this new demographic arena, explaining some of the key concepts and techniques being used, and describing data sources and methods. The significant demographic trends that led to the creation of, and continue to create a demand for, demographics is a good starting point.

Why Demographics Are Important

Over the past two decades there has been growing recognition in the business

Figure 1. Family Expenditures as Percent of Average Income, 1917-19 and 1985



Note: Expenditure composition is not exactly comparable for the different time periods, but the data reflect differences in expenditures of the two time periods.

Sources: Bureau of Labor Statistics and Bureau of the Census

community that demographic trends are critical for marketing. The "discovery" of demographics by business executives and managers represents a convergence of several important developments in business and population studies. Recent demographic trends have caused a revolutionary reshaping of the markets for goods, services, and labor. Changing domestic and international economic and financial conditions have also increased the value of demographic information, while contemporary technology makes it easier and cheaper to access demographic data.

The great economic expansion experienced in the United States in the 20 years following World War II occurred during a period of rapid population growth. The main challenge then for business was to keep up with the increasing demand for housing, appliances and consumer durables, and mass-market goods and services. A booming economy in a booming population brought general prosperity and business growth seemed automatic.

By the mid-1960s a different story was emerging, bearing a rude shock to marketers. The mass market declined; segmented markets took center stage. These had always been present, though masked by the overall growth in consumer demand during the boom. The family car gave way to Mustangs, ranch wagons, vans, VW bugs, and pick-up trucks. "Downtown" was supplanted by shopping malls, boutiques, specialty shops, discount stores, and a galaxy of mail-order catalogs.

Product design and marketing must be tailored to the tastes and buying power of specific, often disparate, subgroups in the consumer population. Demographic information became essential to identify and locate the increasingly diverse consumer groups that constitute the modern marketplace.

Households today have more discretionary income at their disposal than ever before. Before World War II, paying for food, shelter, and clothing ate up 80 percent of the average household's income. By the 1980s, over 40 percent of income was available for nonessential, discretionary purchases. Of course, household income and how it is spent varies as the people forming particular households vary. The age, gender, and level of education of the head of a household and its other members are basic characteristics that determine spending.

Business responded to economic and demographic diversity with market segmentation. As explained by marketing expert Art Weinstein, "segmentation is the process of partitioning markets into segments of potential customers with similar characteristics who are likely to exhibit similar purchase behavior."[2] Companies analyze market segments to find niches that will give them a competitive edge. Most segmentation strategies combine demographic and geographic data with information on consumer attitudes and purchasing patterns. Then advertising, direct mail, and other marketing efforts can be targeted to specific groups of likely consumers, saving money and increasing effectiveness at the same time.

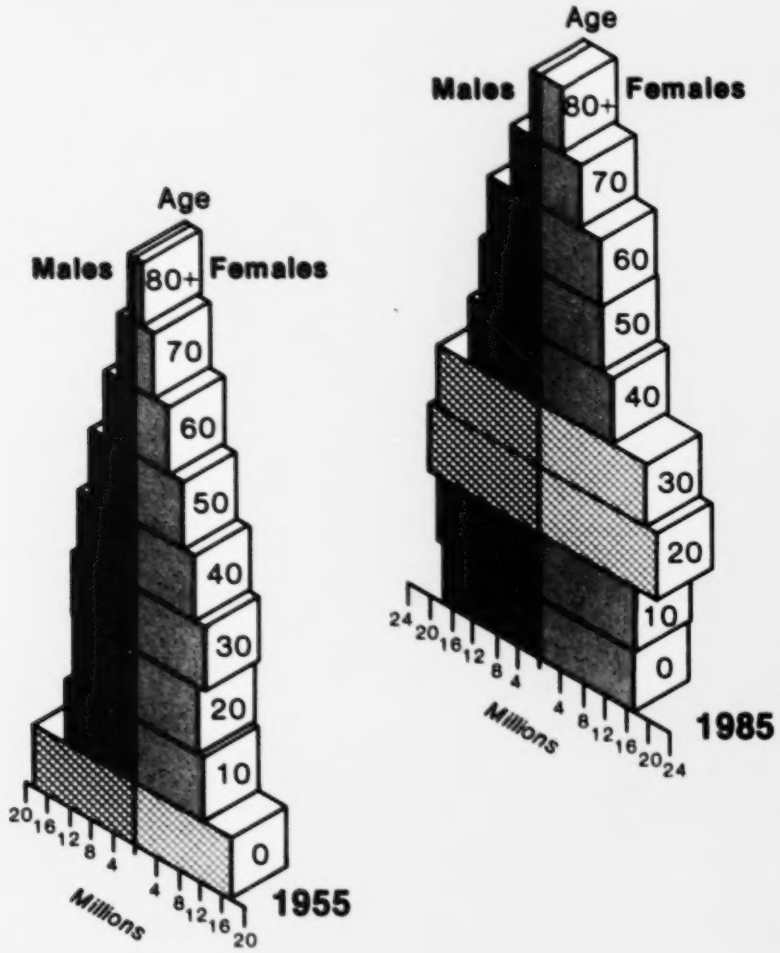
The importance of demographics in business is not limited to consumer demand and the marketing of goods and services. Working mothers, declines in the size of the younger working-age population, workers' changing language, educational, and technical skills—these have major implications for the costs of producing goods and services. Business firms and corporations that provide health, pension, and other benefits need to keep track of changes in the characteristics of their workers *and* their workers' dependents. Demographic factors also impinge on the regulatory environment in which business operates and the tax structure (for instance, the real estate tax burden in an area will be linked to the needs of its school system).

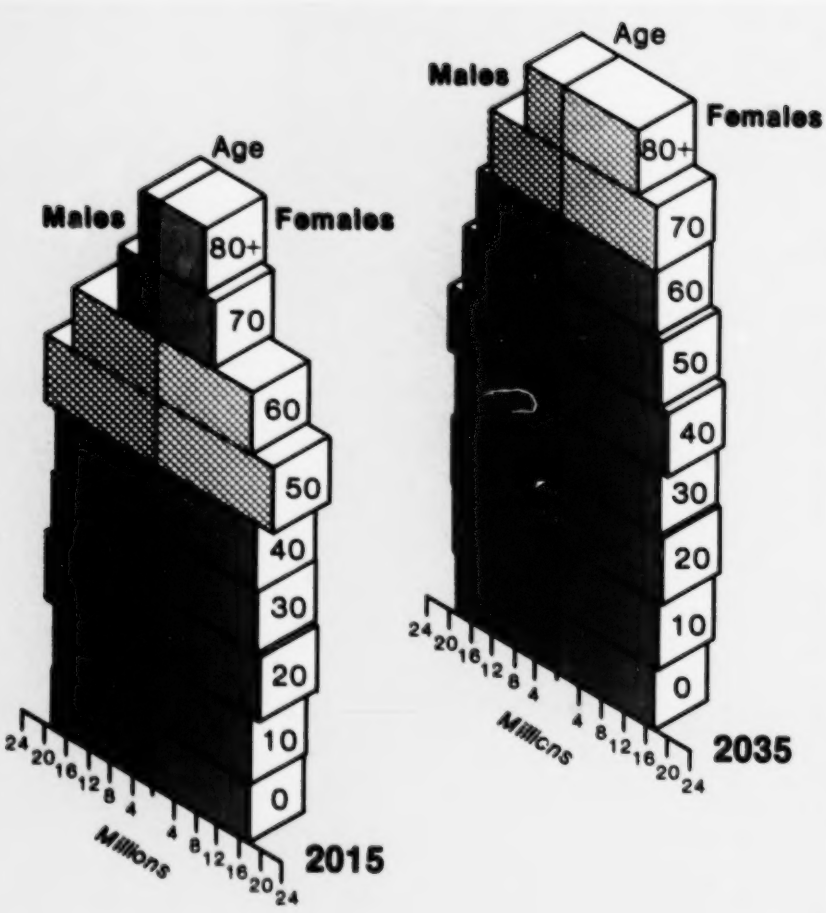
The business demand for demographics has been met by marked changes in the field since 1960, while the ability to get demographics has been greatly increased through the explosion of information technology. Only a few research specialists had access to the relatively rare computer tapes with census and survey data before 1970. Most people went to the library to search for demographic information in printed form. After the release of the 1970 Census of Population on computer tape by the Census Bureau, a whole new industry, selling demographic data, emerged. Advances in computer technology, bringing efficient mass-storage devices, improved data communications, microcomputers, complex graphics facilities, visual displays, and hard-copy reproduction capabilities—all stimulated the growth of demographics. The development of computer software for rapid data retrieval and relational data bases, graphics, mapping, and statistical analysis have made it possible for applied researchers to probe demographic information sources quickly and creatively.

Demographic Trends and the Bottom Line

Awareness of the connection between shifting population trends and the bottom line made business leaders' interest in demographics increase dramatically. Several key demographic and economic changes heightened their attention and brought the point home with a vengeance by causing tremendous waves in the market. The most important of these are changes in age composition, household and family structure, geographic redistribution, labor force composition, and shifting international demographic patterns. Changing domestic and international economic conditions, such as increased competition from abroad in manufacturing, have intensified the importance of demographic shifts. These factors will be discussed in more detail.

Figure 2. Age Composition of U.S. Population, 1955, 1985, 2015, 2035





Source: Bureau of the Census

A series of population pyramids illustrate movement through the life cycle. The relative size of various age groups is clear, as in the marked difference between the baby-boom and baby-bust cohorts.

Changing Age Composition

The baby boom taught business to truly appreciate the impact of demographics on consumer markets. Demographers discuss the "changing age composition" but that usually mundane expression here describes a revolutionary explosion of births between 1946 and 1964 that led to a 75-million-person "bulge" in the U.S. age distribution pattern. This monumental demographic occurrence had a tidal wave effect on school systems, job and consumer markets, and a host of other important social and economic institutions. Baby boomers have made two-earner families, low birth rates, latchkey children, and demographic diversity the new norm in the American way of life. A precipitous decline in births in the mid-1960s brought the end of the baby boom. That, together with increasing immigration flows from abroad, will have major implications for the U.S. labor supply and social services to the end of this century. An increasing number of people at the top end of the age ladder increases the political and economic influence of older people, generating concern about the graying of America. This is already under way, as more people live longer through advances in medical knowledge and care and better living conditions. The aging of the American population will take on enormous significance when the baby-boom generation reaches retirement age during the second and third decades of the next century.

The age composition of a population reflects past demographic events, involving birth, death, and migration patterns. Age pyramids illustrate these links, breaking a population down by age and gender, as shown in Figure 2 (pages 6-7). An age pyramid of the 1985 U.S. population reveals the relative size and place in the life cycle of several key U.S. age groups: the baby-boom generation in their twenties and thirties in the mid-1980s; the generation after them, the baby-bust generation born between 1965 and 1975, passing through their teens in the 1980s; Depression and war-baby groups born between 1930 and 1945 moving through their forties and fifties; and the cohorts born in the decades before and after World War I who are now over age 60. Earlier generations have already moved well into the elderly population category. And while baby-boom couples have fewer children than previous generations, the number of births has nonetheless risen since the early 1970s, because there are so many baby-boom couples to begin with.

In 1986 the first baby boomers reached age 40, and all of them will have passed that milestone by the end of the century. This means that large numbers of people are entering their peak earning years. It is also significant that as the baby-boom generation ages, it will account for an increasing proportion of all households. And the baby-boom generation is so large that variations within the group are big enough to create distinct markets. A major business target is the high-earning young urban professionals, the Yuppies.

Things have changed much over the quarter-century since 1960, when the baby-boom generation stretched from infancy to high school. It was during the late 1950s and early 1960s that the baby boomers had an enormous impact on school systems and created a "youth culture" with the concomitant rapid growth of child- and teen-oriented goods and services. Most of their middle-class mothers dedicated full time to child care and household management. Today's baby-boom-generation mothers are much more likely to be combining careers with child-rearing, and seeking child care and homemaking services in the marketplace. Baby boomers who have remained childless are thinking about how to invest their resources in ways that will insure them the support in old age that children might have provided.

Only twenty-six years after 1985, in 2011, the older members of the baby-

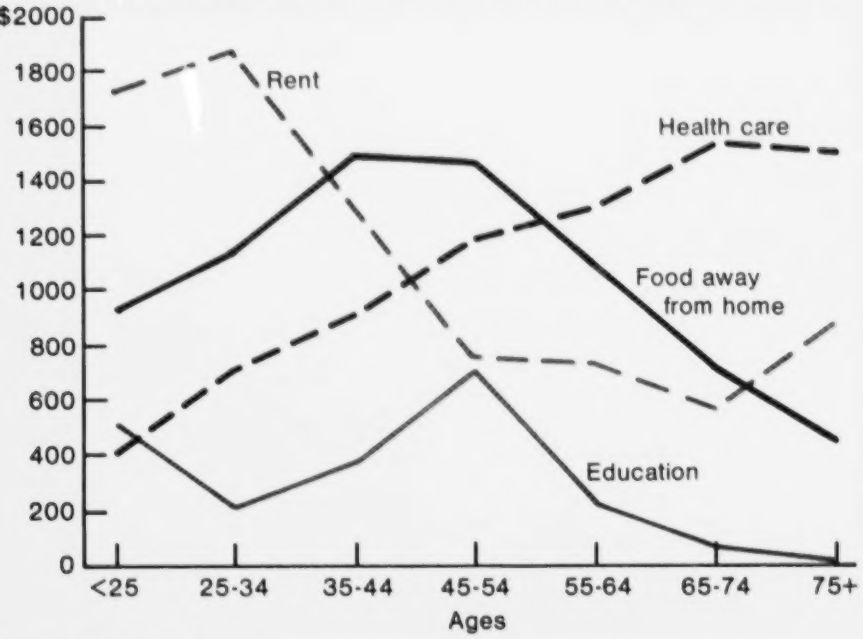
boom generation will turn 65. The rest of the group will pass that age during the subsequent two decades. There is quite a contrast between them and the smaller Depression-decade age groups who are passing that age threshold in the 1980s and 1990s. There will be much less concern about crises in the Social Security Trust Fund in the next few years. The large baby-boom cohorts will be contributing at peak, middle-age earning levels as the smaller Depression cohorts will become eligible for Social Security benefits. Wise baby boomers and members of preceding age groups with increased prospects of longevity will be (in fact, already are) thinking about private investments as alternatives to a Social Security system funded by the much smaller cohorts following their generation.

By 2035, a quarter century later, baby boomers will be counted among the elderly, with the youngest members of the cohort just having turned 70 and the oldest survivors being in their late 80s. These "older elderly" currently cause the greatest strain on our health system, and it is difficult to imagine how society will cope with the demands of the numerous baby-boom generation without major changes in health care and services.

The age of an individual, where a person fits into the life cycle, strongly affects how money is being spent and what is being purchased. Many goods and services are age-sensitive, and business must be aware of changes in the age structure of a population.

Data from the 1984 Consumer Expenditure Survey of the U.S. Bureau of Labor Statistics reveal quite different pat-

Figure 3. Expenditures on Selected Items by Age, 1985



Source: Bureau of Labor Statistics

terns of average annual spending in four major expenditure categories, according to the age of the head of household. For instance, Figure 3 (page 9) shows that rental housing peaks during ages 25-34 and declines thereafter, because few young people own homes. Expenditures on health care rise with age and increasing medical problems, peaking at age 75 and older. The pattern of spending on education has two peaks, one below the age of 25 and another during ages 45-54, when students as well as parents are paying for college and higher education. Outlays for food away from home reach their highest levels between ages 35 and 54. Young people may eat out a lot, but the middle-aged population spends more money when they dine outside their home. This is another area baby-boom cohorts will affect as they move into middle age.

The combination of age-sensitive expenditure patterns and significant differences in the relative size of age groups in the U.S. population is the central reason for the increased importance of demographic information in marketing. But age is not the whole demographic story. Age-group averages mask differences associated with other characteristics; for example, spending on education is obviously affected by the number of children, if any, in the household. Income and gender of the householder as well as the structure and size of households and families are other salient factors to be considered.

Households and Families

For a great many products and services, the basic marketing unit is the household, and, by implication, the family.* The needs and desires of individual consumers are affected by the way they live, who they live with, and what resources their households can generate. As the formation and maintenance over time of households and families, their size, and what the various members see as their roles have changed so much since 1960, and even since 1975, markets have also changed. These changes are a key reason to look at the demographics when assessing the viability of a product or service in the marketplace.

Average family size in the U.S. has undergone a precipitous decline from 3.37 persons in 1950 to 2.69 in 1985. The stereotypical "traditional" family, consisting of a working male breadwinner whose spouse cared for children at home, accounted for less than one-third of American households even in 1960. If this figure seems low, remember that families with children under 18 represent only part of the family life cycle, and the statistics relate to all families and households including those of single people, older couples whose children have left home, and so on. What is significant is that by 1985 "traditional" families had dropped from one-third to one-ninth of all families. Working couples with and without children (DINKs, for instance, "double income, no kids" families), adults both young and older living alone, and single-parent as well as other types of households have increased in relative importance in American household structure.

Most people reside in what are known as "family" households. There were nearly 87 million households in the United States in 1985, of which close to 63 million (72 percent) were "family" households, in contrast to individuals living alone and other types of households. One would think that population growth, family growth, and household growth

*While it is common to think of "household" and "family" as identical, statistically they are different. *Families* consist of groups of individuals related by blood, marriage, or adoption, while a *household* can include unrelated individuals, multiple families, or an individual living alone. Another statistical and census category is *group quarters*, such as military barracks, college dormitories, prisons, etc.

Table 1. U.S. Households: 1960, 1970, 1980, 1985 (in thousands and by percent)

Household type	1960		1970		1980		1985	
Nonfamily	7,939	15	12,430	20	21,227	26	24,082	28
Family with children:								
Married couple, wife working	6,522	12	9,409	15	15,076	19	14,755	17
Married couple, wife not working	16,976	32	15,219	24	9,712	12	9,455	11
Single, female head	1,891	3	3,017	4	4,932	6	6,006	7
Single, male head	301	1	574	1	762	1	896	1
Total family with children	25,690	48	28,219	44	30,482	38	31,112	36
Family without children								
Married couple, wife working	5,648	11	8,047	13	12,262	15	12,602	14
Married couple, wife not working	10,511	20	11,327	18	11,948	15	13,538	16
Single, female head	2,305	4	2,498	4	3,273	4	4,123	5
Single, male head	994	2	1,051	1	1,234	2	1,331	1
Total family without children	19,458	37	22,923	36	28,717	36	31,594	36
Total families	45,148	85	51,142	80	59,199	74	62,706	72
Total households	53,087	100	63,572	100	80,426	100	86,788	100

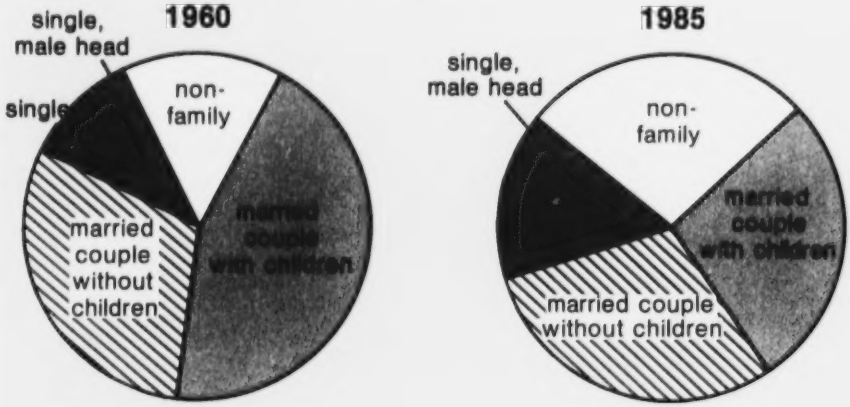
Source: Bureau of the Census

would move in tandem, but in fact they have not. The number of households grew very rapidly in the 1970s—by over 25 percent, but the population grew by only a little more than 10 percent. Much of the growth of households can be attributed to two groups at opposite ends of the age scale. Baby boomers reached the age to form their own households during the 1970s, and, like everything else, they did this differently from previous age groups. They moved out of their parents' households at an earlier age than then usual, but they did not get married; they started households rather than families. They lived alone, or with roommates, or with lovers. Those who did marry delayed it until they were older, and those who had children also waited until they were older, on average, than earlier generations. At the other end of the age scale, older people increasingly have the desire and resources to live independently rather than with their children, resulting in many more one- and two-person households. The middle-aged continue to have high levels of divorce, creating many more single person and single-parent households. These and other factors worked together to increase households more rapidly than families, at the same time decreasing average household size.

Those who live alone, with roommates, or with lovers fall into the household classification termed "nonfamily" by the Census Bureau. Most marketers make no distinction between a conventional "family" and a family which is not statistically defined as such. They think of the nonfamily household as a variant family structure. Statistics relating to households and families do make fairly clear distinctions between the two types of households, however. Nonfamily households grew by 78 percent during the 1970s, compared to less than 16 percent growth of family households.

Household growth, particularly nonfamily households, slowed during the first half of the 80s, in part because economic conditions made it more difficult

Figure 4. Households by Type, 1960 and 1985



Source: Bureau of the Census

for those attempting to enter the labor force to live independently. Households continue to grow more rapidly than population, but the differential rate is much less in the 1980s than it was during the 1970s. From 1980 to 1985, households increased by 7.4 percent compared to a 5.2 percent increase in population.

Even family households are a fairly mixed group. The formal Census Bureau definition of a family is somewhat different from what comes to the minds of most marketers: it includes not only couples with and without children, but also single-parent households with children, as well as other groups such as siblings or any other combination of relatives. Eighty percent of U.S. families are headed by married couples; 16 percent have single females as head of household and 4 percent are single male-headed (see Figure 4). Family households in 1985 were equally divided between those with children under 18 years of age and those without. Among families with single persons as head of households, those headed by women were much more likely to include children than those headed by men.

Since 1960, a year with over 4 million baby-boom births, the family marketplace has changed substantially. As seen in Table 1, family households were 85 percent of all households in 1960; this declined 13 percentage points, so that 28 percent of households had no family in them at all by 1985. In 1960, married couples dominated family households, accounting for 88 percent of families, but the increase of single people as heads of family drove that down to 80 percent by 1985. Fifty-seven percent of family households in 1960 had children under 18, compared to 50 percent in 1985.

There were qualitative as well as quantitative changes between 1960 and 1985. Changes in women's roles within the family from 1960 to 1980 are an important dimension of change in family structure. Only 28 percent of wives living with children worked outside the home in 1960, compared to 61 percent 25 years later. Single female-headed families with children were only 4 percent of all families in 1960, doubling to 10 percent in 1985. A higher proportion of working wives in 1985 is found among married-couple families living with children under

18 (61 percent) than those without children (48 percent). This contrast probably came about because those who live with young children are also in their prime working years, and married couples without children include "empty nesters," older people whose grown children have left their parents' homes.

Although these shifts in percentages indicate the evolution of many new markets, the absolute number of households is crucial to targeting market segments by household composition. For all that has been said about the declining importance of the "traditional" family of two parents and their children, there were about 24 million such families from 1960 to 1985. However, the number of such families in which the mother worked outside the home doubled: from 6.5 million to 14.7 million. At the same time, married-couple families without children increased from 16 to 26 million. So there are fairly large new segments of working mothers and childless couples.

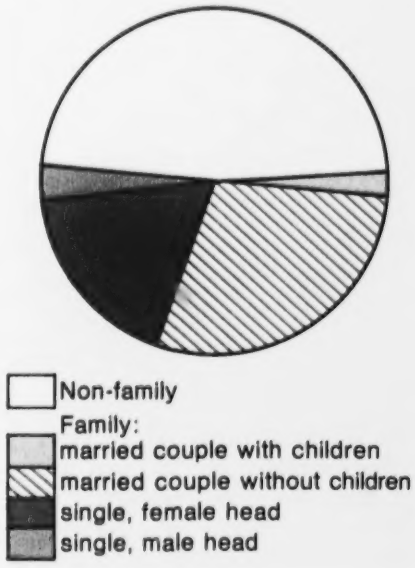
Figure 5 shows this increase in married-couple-only households, as well as female-headed families. Nonfamily households tripled in number, from 8 to 24 million, accounting for almost half of the 34 million increase in U.S. households over this 25-year period.

What do these population trends mean for consumer products? Different types of households have quite distinct consumption patterns, as seen in the 1984 Consumer Expenditure Survey, for example. One-parent households and married couples with children concentrated on the "basics," spending 49 and 64 percent respectively of their after-tax income on food consumed at home, shelter, and apparel. Married couples without children and married couples with adult children (both with a higher representation of older consumers) spent much less on the basics: 43 and 40 percent. The latter group spends heavily in the education and transportation categories. For food away from home, the picture also varies by household structure. Husband/wife-only households and couples with adult children both spent about five percent of their total expenditure eating out. The married couple without children, however, spent much more annually per person, over $550, than did couples with adult children who spent about $400.

Changing Population Geography

Demographics cannot exist without the geographic component: every decision on marketing or site location is strongly geographic. Energy generation, manufacturing, distribution, retailing, commercial real estate development and many other business decisions and strategies depend on where people are and where they are going to be. Many of these decisions focus on areas of rapid

Figure 5. Changing Family Structure: Percent Growth, 1960-1985

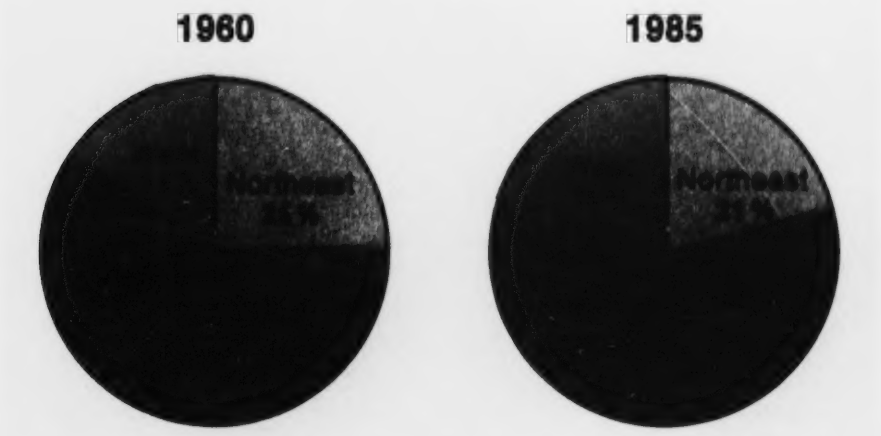


Source: Bureau of the Census

growth. Consumer loyalty can be built in fast-growing areas at a rate which is unparalleled in already developed markets. For retailers, developers, banks, and franchise operations, the frequency and pace of location decisions can be hectic in new-growth areas. The need for information extends beyond locating where people are at this moment to the location of the fields that are likely to become a subdivision or major arterial road for tomorrow's consumers. Population redistribution stretches the ability of governments to serve new residents and creates competitive business opportunities. This contrasts with the hard decisions to be made in slower-growing and declining areas about how to most efficiently serve a market which might have outmoded facilities and with less obvious potential for sales growth.

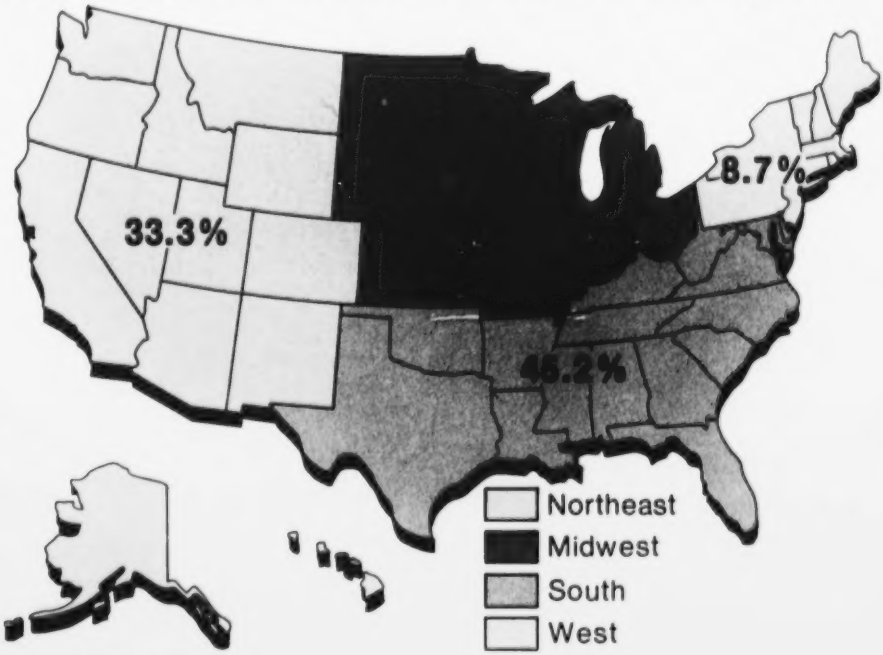
The U.S. population grew by nearly 60 million people between 1960 and 1985, but two regions, the South and West, accounted for an impressive 80 percent of that increase. The Northeast, with 21 percent, and the Midwest, with 25 percent of the country's total population, captured only 22 percent of the national growth during that period. The South, the nation's most populous region with just over a third of the U.S. population, accounted for 45 percent of overall growth. The West, with 20 percent of the total, accounted for one-third of the increase, making it the most rapidly growing region in percentage terms. At this rate, the Western population will be greater than that in the Northeast by 1990. The differences in regional growth trends stem from several causes, including employment opportunities, labor cost differentials, weather, and appeal to certain lifestyles. A "belt" nomenclature has developed: Southern and Western states with warm climates are the "Sunbelt" in contrast to Midwestern and Northeastern states with cold winters, termed the "Frostbelt." States in the latter regions with declining industrial bases are

Figure 6. Population Distribution: Regional Percentages, 1960 and 1985



Source: Bureau of the Census

Figure 7. Regional Shares of U.S. Population Growth, 1960-1985



Source: Bureau of the Census

somewhat derogatorily referred to as the "Rustbelt."

Census Bureau projections picture continuing regional diversity in growth trends during the remainder of this century. In fact, the decline in population in the Northeast and Midwest is expected to continue through 2000. Even with the slower national population growth projected during the 1990s (7.3 percent), the South and West are expected to grow substantially; the South by 13 percent and the West by 18 percent. Though a region's population may be dropping, there are some notable exceptions in some areas. While the Northeastern population increased on the whole by only a fraction of a percentage point during the 1970s, New Hampshire's population grew by 28 percent, largely a result of the revival and northward expansion of the Boston metropolitan area. California ranked 12th among the 13 high-growth Western states in percentage increase during the 1970s, but its large population base was enough to give it the biggest increase in absolute numbers in the entire country.

Internal and international migration are key factors in regional growth differentials. International immigration to the U.S. concentrates in a few states, including California in the West, Florida and Texas in the South, and the New York and Chicago metropolitan areas in the North. Movement of people within the U.S. also favors the South and West. The total net growth from national and inter-

national migration was 3.4 million in the South and 2.2 million in the West during the first half of the 1980s.

These migration streams raise some important questions for business. Every new migrant group forms a new market segment with different needs and tastes. Such demands will affect both the marketplace for consumer products and the business-to-business market as new immigrants pursue entrepreneurial opportunities. For both international and domestic migrant streams, retailers must decide to what extent new residents will retain their original tastes and preferences or whether they will plunge into the "melting pot" of their new location and consume the same regional or national products as their neighbors.

Metropolitan area growth trends also bear watching, since they can run counter to overall regional trends. Metropolitan areas include the 300 or so cities with the largest populations in the U.S. and their adjacent counties, designated as part of an MSA—Metropolitan Statistical Area—by the Census Bureau under guidelines established by the Office of Management and Budget. Metropolitan populations account for the majority of total U.S. population, ranging from 69 percent in the South to 88 percent in the Northeast in 1985. Most metro growth is concentrated in the more rapidly growing South and West, led by areas such as Phoenix, Arizona; Austin, Texas; and Las Vegas, Nevada in the Southwest and West Palm Beach, Daytona Beach, and Fort Myers in Florida. Metro areas in the Northeast and Midwest have, for the most part, experienced low population growth or even declines. There are some exceptions: areas with scenic attractions such as Atlantic City-Cape May, New Jersey; state capitals such as Lincoln, Nebraska; areas on the fringes of large metro areas such as Manchester-Nashua, New Hampshire (near Boston)—all of these metro areas have grown more rapidly than the national average since 1980.[3]

During the 1970s nonmetropolitan areas actually grew faster than metro areas, leading many to examine the causes and implications of a so-called "nonmetropolitan turnaround." Factors such as a preference for "open spaces," changing lifestyles, improvements in transportation and communication which allowed greater commuting distances and decentralization of manufacturing facilities, shifts of manufacturing plants out of central cities, and increased energy extraction activities in response to the oil crisis are said to have contributed to nonmetro growth during the 1970s. By the early 1980s this "reversal" was itself reversed as metropolitan populations again grew faster than nonmetro areas. However, as John Herbers in *The New Heartland* and others point out, much of the nonmetropolitan growth of the 1970s occurred just outside major metropolitan areas.[4] Part of the resurgent metropolitan-area growth since 1980 resulted simply from changing definitions. The government reclassified as "metro" areas of the more dynamic *non*-metro counties on the outer fringes of major metro areas. For example, Frederick, Maryland and Stafford, Virginia "joined" the Washington, D.C. MSA in 1983. Herbers claims that many of these new low density, spread-out settlements on a metropolitan periphery are far less "metropolitan" in character than the typical urban and suburban rings around major central cities. These new areas have the characteristics of what people sought in moving to nonmetropolitan areas during the 1970s, which means that marketers and others will have to pay even closer attention to specific characteristics when using metro data to determine local markets.

Shifts in where people are living are the major change factor in every market. When households move from place to place, they create or change markets much more quickly than does a change in the birth rate. Indeed, in new family-oriented suburbs, the growth rate rises rapidly as the houses are filled, overflowing schools and other facilities. Then

begins a very slow process of neighborhood evolution, where other household types join the earlier nuclear families. Even the slowest growing markets will be affected by migration and population redistribution, which is why these demographic factors should be accorded much attention.

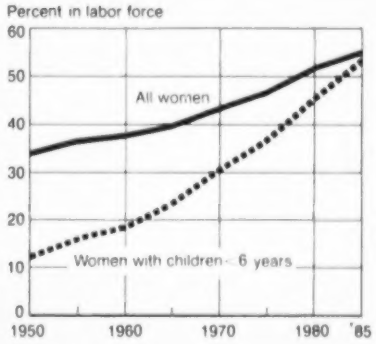
The Changing Work Force

The demographics of the local and national labor force are another key to effective management. The implications of labor force changes are multifaceted, beginning with the fact that employment trends affect consumer demand as jobs create the income needed to purchase goods and services. Is there an adequate supply of workers whose skills match employers' demands? How does participation in the work force affect time allocation, individuals' roles in the family, and the kind of products and services needed?

Profitability is dependent on the availability of workers with appropriate experience and skills. Retailing needs a relatively unskilled, inexpensive labor force, while some manufacturing industries need highly-skilled workers to produce quality goods and meet the challenges posed by innovative technology, international competition, and high-tech products.

The changes in the labor market over the last quarter-century have been nothing short of revolutionary. In 1985 the U.S. civilian labor force numbered 115.5 million workers, 107 million of whom were employed. This was 46 million (or 66 percent) more people in the labor force than in 1960! Women accounted for 61 percent of the total increase, and the percentage of men in the labor force thus dropped from 67 percent to 56 percent as a result. The proportion of wives working outside the home jumped from 30.5 percent in 1960 to 54.5 percent in 1985. The advent of two-earner families has important business implications for the U.S., both because of the impact on family income and because of the accompanying changes in consumption patterns.

Figure 8. Female Participation in Labor Force, 1960-1985



Source: Bureau of Labor Statistics

As increased female participation in the labor force coincided with the entry of the baby-boom generation into the workplace during the years 1960-85, the U.S. work force grew more rapidly during that period than it did in earlier decades. Slower growth is likely to prevail during coming decades when the smaller baby-bust cohorts will be starting to work. There are also fewer older workers in the labor force, as many now have more secure retirement income prospects and may have been offered attractive "early-out" incentives to make way for younger workers or new managements.

The people who joined the labor force between 1960 and 1985 are better educated than any previous generation in American history. In 1987, 85 percent of the labor force aged 25 to 64 had completed high school and 25 percent had four or more years of college. Twenty years earlier, in 1967, only 50 percent had finished high school and just 13 percent had four or more years of college.

Table 2. Labor Force Composition: 1975, 1985, 1995 (projected)

	1975		1985		1995	
	Male	Female	Male	Female	Male	Female
White	50,324	32,508	56,472	43,454	60,471	51,215
Black	5,016	4,247	6,233	6,148	7,380	7,678
Hispanic	2,597	1,574	4,730	2,970	7,048	4,739
Other	960	720	1,708	1,447	2,541	2,313
Total	93,775		115,462		131,598	

Note: Hispanics, constituting an ethnic group, may be included in the racial categories as well as the Hispanic category.

Source: Bureau of Labor Statistics

More good news for the U.S. economy is that these cohorts are or soon will be moving into mid-life, the higher earning—and spending—phase of their life cycles.

The U.S. Bureau of Labor Statistics projects only a 12 percent increase in the labor force from 1985 to 1995, compared to a 23 percent rate of growth in 1975-85. This reflects the drop in births since 1965, the "baby-bust" cohorts. Women again account for 60 percent of the projected increase; white males, who contributed 29 percent of the 1975-85 increase, are expected to be 15.5 percent of 1985-95 work force growth. The "wild card" in labor force projections is immigration into America from other countries. It is likely that Hispanic and Asian migrants will contribute significantly to labor force growth in coming decades.

The projections of labor force participation also show that the new entrants during 1985-1995 will not be as well educated as those who entered the labor market between 1960 and 1985. There is growing concern about the availability of workers needed to deal with very sophisticated technology and in information-oriented industries. Many hope that these goods and services will give the U.S. a competitive edge in the world economy. According to the Department of Labor, most future labor force growth will come from groups in the population that traditionally have been underutilized and have had trouble finding rewarding jobs. Women from low socioeconomic levels, members of minority groups, and immigrants will account for over 80 percent of the net additions to the labor force between 1985 and 2000.[5]

With slower overall growth in the labor force and much of that growth concentrated in members of minority groups, many rapidly growing suburban areas are experiencing labor shortages among retail and other relatively unskilled occupations. These jobs were customarily filled by teenagers or wives working part-time. With fewer teens in the baby-bust cohorts, few women willing to work only part-time, and few members of minority groups living in the suburbs, many companies and stores are having to rethink their staffing strategies.

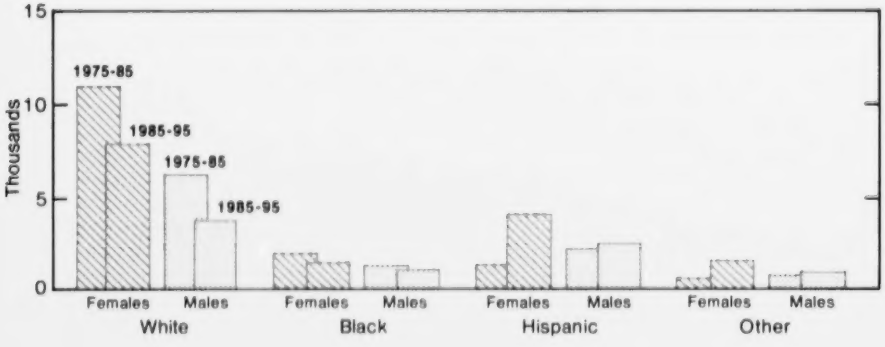
There are many areas in which labor force demographics affect corporate decisions. As a corporation's labor force and their dependents age, health care costs may rise. The need for on-the-job training, retraining, and adult education will rise as more immigrants and educationally-deprived members of minority groups join the work force and as industrial restructuring forces occupational shifts on middle-aged workers because of changing technology and international trade patterns. Broader participation in the labor force by women is just beginning to affect both the supply and character of workers in many industries, and the demand for innovative goods and services.

International Population Trends

International population trends have also contributed to the increased significance of demographics. Over the last few decades, population growth trends in more and less developed countries have diverged. Rapid population growth in less developed countries has increased consumption needs and made their labor cheaper, giving them an increasingly competitive edge in mass-market consumer goods. Population growth rates have slowed and sometimes stopped altogether in the more developed industrialized economies of Western Europe, North America, and Japan. Since fewer workers lead to higher labor costs, many more developed countries have shifted their industrial mix toward specialty goods and services. These typically require select skills and training for production and identification of specific consumer groups for marketing.

Developing countries have also increased in importance as markets for U.S. exports. New trade patterns are being established. While newly industrializing countries (sometimes referred to as "NICs") such as Taiwan, South Korea, Singapore, Brazil, and Mexico are becoming increasingly competitive with the U.S. in the manufacture of textiles, shoes, steel, automobiles and auto parts, as well as consumer electronics, they are also an important market for U.S. goods and services, particularly agricultural products, telecommunications, as well as information and financial services. The share of U.S. exports going to these five countries increased from 12 to 15 percent between 1975 and 1985, and would have increased even more had it not been for recent debt-related recessions in Brazil and Mexico, forcing them to curtail imports. The NICs, with their rapidly urbanizing populations, were good markets for U.S. agricultural exports as long as their economies remained dynamic. The decline in U.S. agricultural exports to Latin America during the early 1980s resulted more from the region's declining purchasing power than increases in its agricultural production capacity. While the struggle to increase living standards in less developed countries requires them to become more competitive with the U.S., an increasingly prosperous Third World will also be a better market for U.S. goods and services, provided

Figure 9. Labor Force Changes, 1975-85, 1985-95 (projected)



Note: Hispanics may be included in both racial and ethnic categories.

Source: Bureau of Labor Statistics

U.S. exporters take advantage of this new market potential. Some export-conscious managers have been paying increased attention to international demographics. Ironically, officials at the U.S. Census Bureau's Center for International Research were somewhat chagrined to learn that Japanese businessmen were more interested than American firms in their international market-oriented demographic data products.

Benefits of Using Demographics

The most important thing to learn from demographics is that no market is monolithic—there are always advantages to be gained by segmentation. This holds true even for the period of the 1950s: there were groups with markedly different needs, but the size of dominant segments as well as the prosperous economy boosted sales without much effort on the part of business. That situation no longer exists.

Demographic trends affect American society like tidal waves, and managers and marketers ignore them at their peril. Broad trends like the progress of baby boomers through the life cycle and age structure, changes in households and families and in their members' roles, changing population distribution, changing labor force, and the changing international context have impacts which cannot be ignored. There are also many micro-trends which affect the marketplace on a daily, monthly, and yearly basis. These trends must be tracked for every industry if management is to be effective and successful.

Each product and industry has multiple links with the demographics of the marketplace. Demographic analysis allows the analyst to relate a product or industry to the broad trends outlined and to smaller trends among key consumer segments. As the rest of this *Bulletin* will demonstrate, demographics and the use of other secondary data can be the starting point for *effective targeting to increase* the efficiency of dollars spent on manufacturing, distribution, and advertising. Demographics save resources and time; they provide a cost-effective starting point for market analysis and permit pinpointing geographic access to the primary market segments for a product. In a time of growth and expansion, using demographics will increase efficiency and encourage faster growth. In times of contraction and scarce resources, demographics are essential to prevent losses of precious time and money.

A simple but telling example of cost-effectiveness is catalog mailings. An understanding of the demographics of an address list can decrease mailing costs and increase the ratio of sales per mailing, e.g., by not sending seed and garden tool catalogs to high-rise apartment dwellers and by targeting specialty gift catalogs to higher-income professionals who have less time to shop in stores.

Politicians have also learned the effectiveness of demographics for their campaigns and fund raising. They particularly have to try to pinpoint those most likely to vote within their district, as well as those most likely to vote for them, in the face of escalating campaign costs and the disintegration of traditional party alliances. Their demographics combine population data with past election returns for small geographic areas plus information on individuals' past political contributions, magazine subscriptions, and the like from direct mail data bases.[6]

Selection of sites for retail outlets, plants, and other facilities has benefitted greatly from the availability of geographically detailed demographic data and the capacity to create profiles for geographic units other than normal political and census boundaries. Financial institutions often require analysis of a location before they will provide financing for new projects. An important factor in the selection of a site for a manufacturing facility, for example, is the availability of

labor with the appropriate skills, experience, and other characteristics which have a direct effect on costs. New patterns of decentralized industries are related to changing residential patterns, particularly where populations have been moving away from core areas of metropolitan areas to suburbs.

Long-term strategic planning is essential for corporations, public utilities, school systems, and other public services that require substantial capital investment. Planners need to be able to identify trends and project future growth, particularly since many of these investments are cost-effective only if they can be made to anticipate growth in demand over a 10-20 year time horizon. Planners benefit from demographics by what is sometimes labeled "environmental scanning." This refers to efforts to profile the social, economic, and demographic characteristics of a region, for example, the area served by a public utility or transport authority. Such profiles also enable business planners to track and anticipate changes in the market for the goods and services they provide as well as factors that might affect their costs of doing business, allowing them to plan for declines in certain activities and the expansion of others. The demographic component of these profiles is one of their basic building blocks, and the demographer in a strategic planning department works not only at getting accurate demographic data but in showing how demographic trends might affect and be affected by other ongoing or anticipated trends in the area.

Large organizations have their own internal demographics, as well as their own cultures, which can influence the costs of doing business in a number of ways. For instance, the population of an organization has its own age structure along a spectrum of older employees retiring, young workers just starting. The fast-food industry depends upon an age structure of very young workers and is now having a more difficult time recruiting young workers because of the small baby-bust cohort teenage population. Some chains are now looking to older workers as a substitute work force. As the baby-boom generation moves into middle-age, organizations that hired large numbers of entry-level baby boomers will have to deal with a promotion-ladder squeeze resulting from their many skilled and experienced employees looking for advancement to a few senior positions. They risk losing the investment they made in training these employees and face morale problems if they cannot find alternative ways of rewarding experience and loyalty to the firm.

Entrepreneurially-spirited members of this baby-boom group are launching their own businesses rather than languishing on the lower rungs of the career ladder in larger organizations. Advances in microelectronics and communication technology boost this trend. The number of small businesses started in 1986 was considerably higher than it was ten years before. Women, who face the fact that prejudice may keep many of them from reaching top positions, owned about one-quarter of all U.S. firms in 1982.

Health benefits and retirement plans are a significant share of labor costs, and are affected not only by the internal demographic structure of an organization but also by the group composition of their employees' dependents. Actuaries have traditionally worked with personnel departments in designing such plans, but boardrooms are looking increasingly to their strategic planners for guidance on the longer-term cost implications arising from an aging employee and dependent population and from the increased participation of working mothers in the labor force, including discussions and pending legislation on parental leave and day care facilities.

The Demographic Analysis Process

The first step in any analysis is to ask the

right questions: what problems need to be addressed, and what data would provide the answers in the ideal case? This is the time to consider a broad range of information and to find a focus to guide the search through masses of data. Real-world data hardly ever match the ideal, and the volume of available information can be deceptive. The lack of a constrained set of questions carefully oriented toward the problem will lead to the accumulation of a flood of irrelevant data.

For any consumer product, the key question is, "Who is the customer, the real customer?" The real customer for children's toys may be children, or it may be the parents and grandparents of the children. The real customer for senior living facilities may be older people, or it may be their caregivers, depending on the characteristics of the facility and its residents. Once the customer has been identified, a new series of questions can be asked.

In assessing the demand for any product, these questions can be divided into several research stages. At the first stage, all existing data pertaining to a topic are amassed. These are called "secondary data" because they are derived from existing sources such as the U.S. Census, survey results, and other administrative and proprietary sources. Since these data have already been collected and processed, they have the advantage of being relatively inexpensive and readily available. The point is to make them do double and triple duty and answer questions which were not posed when the data were collected. Much of the skill involved in demography and other applied analyses lies in the ability of the analyst to adapt and reinterpret existing data.

Demographics are valuable because demographic techniques make it possible to extract a great deal of new information from existing data. Secondary data analysis is quick, efficient, and inexpensive, especially in comparison with primary research such as taking surveys, conducting focus groups, etc. Secondary research sets parameters on the issues and defines the questions which should be pursued in primary research. Demographics are among the most useful of secondary resources; in fact, the application of results from primary research is impossible without demographics. Primary research itself should never be undertaken without substantial preparation through such secondary research. Primary research remains primary for only a very short time. It is soon "outdated" or no longer current, yet it represents a major investment of time, energy, and resources by any firm and it should be exploited fully over a long period of time.

Demographic Data: The Raw Material of Demographics

"Drowning in information, starving for knowledge."

John Naisbitt

The amount of readily available demographic and other secondary information is truly staggering. Demographics result from what has come to be known as the information revolution, a phenomenon combining improved data storage and retrieval, communication, and computational and display technology with an immense increase in the volume of information collected. That is why the first step in the demographic analysis process is to define closely the goals of any investigation, lest the analyst get lost in the forest of data and be unable to locate the trees that represent pertinent information.

Organizations and individuals involved in demographics put a great deal of their time, money, and effort into information management. Before the information revolution, the printed page was the basic medium of information storage and retrieval. Data users spent most of their time copying figures from published volumes and in manual or mechanically as-

sisted calculations based on those figures.

The comprehensive basic source of demographic information for the U.S., the Census of Population and Housing, illustrates the information explosion. A slender volume of 56 pages summed up the results of the first U.S. count in 1790. For the 1910 Census, 4,300 pages were devoted to population topics, and by 1950 the Census report took up several library shelves with its 50,000 pages of population and housing information. The number of pages doubled to 100,000 in 1960, and doubled again to 200,000 in 1970. Not only did the number of pages increase, but advances in electronic photocomposition made it possible to pack more information on a page, so that the average page of a 1970 Census report contained 20 percent more data than its 1960 counterpart. In 1960, the costs of printing and effectively managing the volume of census information led census authorities to explore other media, including computer tapes and microforms. For the first time in history, analysts outside the Census Bureau were able to obtain a sample of individual census records (without identifying information which would threaten census confidentiality), enabling them to make custom tabulations of questions that the published reports did not address. Public Use Microdata Samples (PUMS files) are now available for each U.S. Census from 1940 through 1980. Microform publication started in 1970, and now microfiche cards holding up to 96 printed pages make it possible to store the content of published reports in a few small file boxes rather than 40-50 linear feet of shelf space.

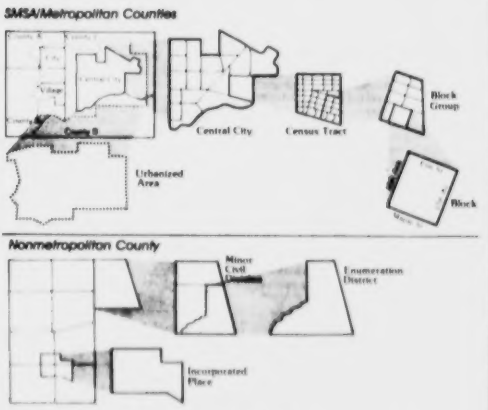
For most business users of census data, the 1970 Census brought the most significant advance in the dissemination of results: the publication of summary tabulations on computer tape. Two thousand tapes of 1970 Census data were issued, covering geographic areas from the national down to the block level. While the number of computer tapes published in 1980 remained at 2000, increased data storage density made it possible to store 12 times as much information. Dissemination of summary tabulations on computer tape opened the door to storage and retrieval of detailed census information on computerized data bases.

Basically, summary tape files increase the amount of available census data by providing the same kinds of information that appear in printed reports but with much greater geographic detail. What really distinguishes the census from other data sources and makes it *the* basic source of all demographics is its geographic detail. No other source attempts to—or can afford to—provide a comprehensive set of information for every city block and rural district in the country. The geographic process is explained in the box on page 24.

For secondary data, the basic question is, What is the most reliable and authoritative source of information? Since the census is the most basic and comprehensive source of secondary data, this question often translates into, Which source translates, tabulates, and updates the census the best? There are many other sources of secondary data to assess, but in demographics, census is king, and demographic information specialists typically begin their data searches there. The Census Bureau itself updates data through its ongoing series of Current Population Reports (known as the "P" Series) with national, regional, and some metropolitan area data, which are useful in tracking changes at those levels. Because they are based on smaller samples of the population, surveys lack the geographic detail of the decennial census.

When research, marketing, and labor market questions are focused on the national level, the foremost authority is the Census Bureau itself. The Bureau has a substantial research staff who are unmatched in the degree of attention which they can pay to particular trends, topics, and markets. There is a whole

Box 1. Census Geography



Reproduced from Bureau of the Census, *Census '80, Introduction to Products & Services* (Washington, DC: GPO, 1980) p. 5.

Census geography follows conventional political divisions at the state and county level. Divisions within counties can differ if counties are part of a metropolitan statistical area (MSA). In nonmetropolitan counties, census geography has been adapted to the variety of political divisions found within different states: cities, villages, towns, townships, boroughs, and all manner of other divisions. The Census Bureau establishes census county divisions (CCDs) or, where there are active subcounty governments, the Census Bureau may designate minor civil divisions (MCDs). With MSAs, metropolitan counties can have MCDs or CCDs, but in addition they are divided into census tracts which conform to neighborhood lines and have an average population of 4,000 people. Tracts are in turn subdivided into standard city blocks and block groups, as illustrated here. Census geography also recognizes rural and urban areas, congressional districts, and Indian reservations. Census geography is explained in the *Census Users' Guide*, the key source for geography and other census documentation and essential for anyone involved in demographics. The Bureau also provides detailed printed maps and computerized map files with detailed geographic information.

The computerization of census geography is another breakthrough in information technology that contributed to the growth of demographics. The Census Bureau initially developed GBF/DIME (Geographic Base File/Dual Independent Map Encoding) for metropolitan areas to assign geographic codes to 1970 Census records. These files are computerized versions of the Census Bureau's metropolitan area maps, and have block-by-block address ranges and latitude-longitude coordinates or nodes at intersections. For the 1990 Census, the Bureau has a TIGER—Topologically Integrated Geographic Encoding and Referencing system. TIGER files will provide a single automated source of geographic information for data collection, products, and services connected with the 1990 Census.

branch devoted to household and family trends, for example. Also, when a question crosses state or regional lines, often the Bureau will have a perspective which inherently controls subnational figures to add up properly to national totals now and in the future. The annual *Census Catalog and Guide* is a veritable shopper's guide to the Bureau's reports, special studies, and data products for a wide range of topics and geographic units.

For many other topics at the national level, there are also strong federal resources. For economic and labor market questions, there are the Bureau of Economic Analysis in the Department of Commerce and the Bureau of Labor Statistics in the Department of Labor. The National Center for Health Statistics tracks births, deaths, marriages, and divorces, and the Centers for Disease Control follow epidemiological trends. In short, there are substantial and well-informed organizations providing information on the U.S. The federal statistical system publishes reams of information in book and computer form.

At the state level there are also substantial statistical and analytic resources. A state-based focus for the dissemi-

nation of statistical information of all kinds has grown up around the "state data centers" established under a Census Bureau program, often headed by a state demographer, and encompassing both data collection and information distribution. At the state level, this combines departments of planning, local affairs, and health statistics, along with universities and state library systems. State data centers also have a system of local affiliates that includes libraries, planning commissions, councils of governments, and even Indian tribes.

The prime function of the state data center network is to put demographics in the hands of those who need them at the state and local level. This network includes hundreds of organizations with staffs skilled and experienced in demographic methods as well as being knowledgeable about regional and local population trends. Just as federal statisticians have a more global perspective than those in states, state-level analysts can be relied upon to provide a multi-county perspective within states. Virtually every state has a set of population projections for its counties. State data centers provide excellent information and analytic services. In addition, their prices are often at-cost or free. They sometimes lack the packaging and "instant" service available from commercial firms, however.

The final link in the public sector information chain is the local analyst—usually based at the county or city level, typically with the title of "planner" and occasionally "demographer." These are the people who have a gut-level feeling for what is happening in an area, as well as *why*. Also, the planning, zoning, building permit, and deed-issuing staffs know what is likely to develop tomorrow because they issue authorizations for the infrastructure to support changes.

Public sector data are indeed voluminous and widely disseminated. Census data in printed volumes and on microfiche are available in thousands of libraries across the country. For census tracts or any area larger in population than 2,500 people, there are lots of data in the 1980 Census printed volumes. For counties and MSAs, there is much more census detail in print than is readily available from computerized sources. Data for city blocks and block groups can be obtained for the price of reproduction from microfiche. The U.S. Government Printing Office's Document Depository Libraries have a particularly rich collection of census data as well as information from the entire federal statistical system. This list covers births, deaths, bedsprings, feather pillows, the business censuses including retail trade, wholesale trade, manufacturing, construction and extractive industries—and this just scratches the surface of what is available. Document Depository librarians hold the key to this array of information. Libraries are also a good source of proprietary data published by commercial firms—demographic, economic, and otherwise, since they often subscribe to commercial services.

If answers to local data questions cannot be found at the library, the next logical place to look is state data centers. If state data centers fail, then it is time to follow Matthew Lesko's "Seven Phone Call Rule," and start calling other government statistical sources directly. Lesko, an expert on free and nearly free information, recommends a calm, persistent approach which recognizes that the seventh person called will want to help, but will not know anything about the frustrations you may have suffered with the first six.[7]

The Commercial Data Industry

The private sector demographics vendors are often the most convenient resource for business. They concentrate on consumer market applications, trends, and data, as well as the packaging and delivery media that make the data easy to use. Many businesses cannot afford to spend staff time on demo-

graphics even if there are in-house skills. They prefer to pursue what they are best at and what makes them the most money. So, the most efficient method for businesses to acquire demographics is to buy them from those devoted to supplying them.

One of the quickest and most convenient ways of compiling census data, updates of the census, and estimates of retail potential for a wide range of products is to purchase them from one of the major firms which maintain current national demographic data bases, such as CACI, Inc.; Claritas; Donnelley Marketing Information Services; National Decision Systems; National Planning Data Corporation; and Urban Decision Systems, Inc. These six firms together provide some $40 to $50 million worth of information products and services annually. They have two main product lines, as well as many related kinds of data and methods to enhance and extend the application of those products. The product line that built these firms is the area profile constructed from census-based extract and update data. Large national retailers, such as supermarkets and department stores, were among the first users of these trade area profiles. Fast-food and convenience stores also realized the value of demographics in determining the location and number of outlets.

Area profile reports are based on vast data sets that contain information for approximately 67,000 pieces of geography which encompass the entire United States of America. These data sets include every census tract in the country where tracts exist (inside metropolitan statistical areas, MSAs, and other selected densely populated areas), as well as all minor civil divisions or census county divisions outside of the tract areas. The great strength of these systems is that they can deliver a profile of any area in the country almost instantly. Clients can design their own custom geography to suit any particular issue of interest, and the demographic firms will combine small area data to approximate the desired area.

Profiles include a series of the most commonly used census data extracted from 1970 and 1980 Census Summary Tape Files. Topics covered include demographic characteristics such as age, sex, race, and family structure; socioeconomic characteristics such as income, labor force composition, educational level attained, and housing stock. All six firms supplement their census data bases with annual "updates" of demographic and income characteristics such as total population, age and sex, households and families, and income distributions.

Convenience and delivery are a main selling point for commercial firms. Customers can call companies and have printed reports shipped to them via overnight delivery, or they can use personal computers to request reports themselves over a number of nationally available time-sharing computer systems. Recent innovations in computer hardware and software have made it possible to store these immense national data sets and report-generating software on laser-based compact disks connected to desktop personal computers. In addition, data extracts are available in book or computer diskette form.

How can these products be applied most effectively? The derivation and bases of these products bear some examination, since sources and methods used to create data determine their applicability and validity. There are three sets of methodology with which potential users should be familiar: the geographic methods for reconstructing custom areas; the update methods applied to census data; and the methods which create the retail potential reports.

Geographic Methods

In their literature, companies say they can create a profile for "any place, any size, any shape, anywhere in the country." Their basic data sets of 67,000 tract/MCDs are recombined to form all areas

which do not conform to standard census geography. This is accomplished by using information from sub-units of the tracts or MCDs, most commonly block groups and enumeration districts (BG/EDs). For each BG/ED, the data base contains the latitude and longitude of its centroid (the street-network-based geographic center of the area) and the percent of the tract/MCD population which the BG/ED contains.

A very common application is for a customer to request a profile of a trade area within three miles of a given street intersection. The latitude and longitude of that intersection are calculated from a map and entered into a computer retrieval system which addresses the BG/ED and tract/MCD data bases. Then the retrieval system scans the data base to find all BG/ED centroids that fall within the three-mile radius. For each BG/ED centroid falling within the circle, a portion of its parent tract is allocated to the trade area profile. Firms use different sets of BG/ED centroids, or, in the case of one firm, a variant called "circular fields" but they all perform the same function—allocating tract/MCD portions to trade areas.

These methods work very well as long as the trade area to be profiled is large enough and the base area has detailed geographic and tract information. Densely populated Manhattan Island in New York City yields much better profiles than smaller Manhattan, Kansas, for example. One problem which occurs is a direct result of using allocated portions of tract totals to represent smaller areas that fall into a trade area. If the trade area encompasses a portion of a tract comprised exclusively of single family dwellings and dominated by nuclear families, but the rest of the tract is made up of apartments filled with single people, then the portion of the tract allocated by the retrieval and profiling software would erroneously show a mix of families and singles. Another frequent problem is when very small areas are profiled—in which case adjacent small areas will be drawn from the same single tract/MCD and therefore appear to be clones in every percent distribution, but different in total numbers. It is a simple but important matter for customers to examine carefully the base geography applied—which can be done because companies offer "component area reports" that list the tract/MCD portions and BG/EDs included.

Sampling error is also a factor in small area demographic data on census sample items such as income and occupation. For a single census tract, the number of individuals in an occupational category could be quite a bit at variance with the true figure. While vendors and their clients typically ignore sampling error, it could account for misleading findings.

A variant of these geographic methodologies is the reconstruction of zip code profiles. Zip code geography is an oxymoron—zip codes are administrative areas created by the U.S. Postal Service to ensure efficient movement of mail, and they have no truly set boundaries. Boundary changes and the creation of new zips are frequent: they're often poorly understood even by local postal workers. It is an overwhelming task to track such changes, and a difficult matter to create demographic profiles of zips. The basic tool used is a zip-to-tract/MCD correspondence file, which allows companies to translate their basic tract/MCD data into zip profiles. Methods for constructing zip-tract correspondences vary widely across the industry, and so do the resultant demographic profiles. A recent comparison by the International Council of Shopping Centers of a selection of zip profiles from six cities showed significant variations among the six firms' updates.[8] Zip codes are sometimes the only usable piece of corresponding geographic information in clients' own files, so they require zip demographics. The ICSC results suggest that such demographic analysis be approached with great caution.

Update Methods

Another immense task undertaken by the commercial demographic firms is the annual updating of their profiles. The census is taken only once each decade in

America, but data customers demand information for the most recent period. Every year, data firms issue updated estimates for the current year and 5-year projections into the future for over 3,100 counties and 67,000 tract/MCDs across the country. To arrive at updates of total population, the firms use extrapolative methods based on past trends or changes in the number of mailing list entries. In addition to total population, the age-sex structure, race, numbers of households and families, income distributions, and even age-income distributions are updated. Up to 15 million separate numbers are generated in this updating process. Needless to say, a major component of updating is quality control—usually automated quality control, since it is impossible to review such a volume of data by hand.

The advantage of updates is that they represent the logical playing out of trends apparent in secondary data. Updates show what an area looks like today and five years from now, *if* certain trends continue. In preparing the updates, data vendors apply techniques that are well beyond the technical abilities of their customers if their customers had the desire or the time to do the work. Many data sets are marshalled to create updates, including county estimates of population from the Census Bureau, special censuses the Census Bureau has conducted, local estimates, mailing lists derived from phone books and other sources, projections prepared by the Census Bureau and states, economic estimates and projections made by the U.S. Bureau of Economic Analysis, and so on. However, there is very little comprehensive demographic information available below the county level other than the census.

The main disadvantage of updates is that there is the greatest likelihood of error in the rapidly-growing areas where customers often display the greatest interest. *None* of the updating systems for the very small local tract/MCD areas can adequately capture explosive growth, particularly if that growth has occurred since 1980. Many of the demographic methods used for updates of population composition were developed for larger areas, and the assumptions and data on which they are based are stretched to their maximum when applied to the tract/MCD level. In the case of income distribution updates, there are no standard, accepted methods. Results of income updates have to be interpreted as merely suggestive of what might have occurred since the last census.

Given these observations, as well as the obvious problems of adequately creating and analyzing such a large volume of data annually, it is apparent that update results should be applied with caution. The soundest possible base for local area analysis is, unfortunately, still the most recent census. Most analysis which deals with local area data should be done twice—once with 1980 data, and once with updates. On the other hand, updates can be applied with confidence at the first screening stages of an analysis, and possibly also to questions and decisions which involve relatively small investments. But for decisions which involve significant expenditures of resources, additional confirming data should be sought.

Geodemographic Systems

"Geodemographics" is a neologism for a set of geographic and demographic techniques which assign catchy labels to small geographic units. These are based on demographic and socioeconomic characteristics of the people who live there. For example, a suburban neighborhood with mostly high-income young adult professionals might be classed as "suburban Yuppie." CACI's system is called ACORN, Donnelley's is *Cluster Plus*, the NDS system is VISION, and Claritas has PRIZM (see accompanying box). They are all based on 1980 Census data for very small areas and a statistical technique called cluster analysis, which

Box 2. "Cluster" Consumer Targeting

Listed are the 40 PRIZM Lifestyle Clusters of Claritas. Organized into 12 broad social groupings, they are coded "S" for suburban, "U" for urban, "T" for towns, and "R" for rural. They are shown in descending socioeconomic ranking.

Code	Nickname	percent of 1987 households
S1	Blue Blood Estates	1.13
	Money & Brains	0.94
	Furs & Stations Wagons	3.19
S2	Pools & Patios	3.42
	Two More Rungs	0.74
	Young Influentials	2.86
S3	Young Suburbia	5.40
	Blue-Chip Blues	6.04
U1	Urban Gold Coast	0.48
	Bohemian Mix	1.14
	Black Enterprise	0.76
	New Beginnings	4.32
T1	God's Country	2.71
	New Homesteaders	4.16
	Towns & Gowns	1.15
S4	Levittown, U.S.A.	3.05
	Gray Power	2.94
	Rank & File	1.41
T2	Blue-Collar Nursery	2.24
	Middle America	3.19
	Coalburg & Corntown	1.93
U2	New Melting Pot	0.90
	Old Yankee Rows	1.59
	Emergent Minorities	1.72
	Single City Blues	3.35
R1	Shotguns & Pickups	1.85
	Agri-Business	2.09
	Grain Belt	1.24
T3	Golden Ponds	5.25
	Mines & Mills	2.84
	Norma Rae-Ville	2.34
	Smalltown Downtown	2.44
R2	Back-Country Folks	3.43
	Share Croppers	3.98
	Tobacco Roads	1.22
	Hard Scrabble	1.50
U3	Heavy Industry	2.73
	Downtown Dixie-Style	3.37
	Hispanic Mix	1.88
	Public Assistance	3.10

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allows for the classification of those very small areas.

The underlying logic of geodemographics is simple: discover what neighborhood an address is in, and then use census data for that neighborhood as a surrogate for direct information on households or individuals. The underlying assumption: "Birds of a feather flock together," i.e., most residents of a neighborhood share the same characteristics, tastes, and preferences. When a business has next to no information beyond customers' names (which are not needed) and addresses, these systems offer a way to classify and examine them.

Geodemographic systems are constructed at the block group and enumeration district (BG/ED) level. BG/EDs are the smallest area for which 1980 Census socioeconomic data are disseminated. Using information on age, race, income, labor force, and housing for all 260,000 U.S. BG/EDs in a cluster analysis framework, geodemographic systems will establish about 45 (the number is not magic) classifications or clusters of BG/EDs. After the clusters are established, every BG/ED is assigned to the cluster type it most closely resembles. Clusters are then assigned shortened "nicknames" which are evocative of the majority of people that live in a particular cluster of BG/EDs. The assumption is that residents of similar cluster types across the country will exhibit similar consumer needs and behavior.

The cluster descriptions thus suggest implications concerning peoples' lifestyles that are not in the census data themselves. Also, although the systems are based on the BG/ED census tabulations, the claim is usually made that every *household* in the country has been classified. This is true only to the extent that each household is weighted into the neighborhood average.

The main "birds of a feather" assumption behind these systems is that the 45 BG/ED classifications represent everyone living within the area. An infant and a senior citizen who are neighbors would

be classified the same. This is what is known as an ecological fallacy. However, the idea is that the system will be able to distinguish neighborhoods of primarily young families with children from those which house predominantly elderly people.

While it is simple to find fault because of the ecological fallacy and the relative crudeness of these systems, they are powerful. In the case of targeting direct mail, when address is the only information available, simply raising response rates from four to six per thousand pieces mailed is both valuable and cost effective. Retail store trade areas can also be automated through geocoding if a customer address file is available from credit card charge slips or customer intercept surveys. Once a consumer survey has had cluster codes assigned to it, consumption rates for each cluster type can be calculated. Then, for every type of neighborhood found in a target trade area, a simple potential penetration rate is known.

Retail Potential Measures

Reports on retail sales potential for trade areas extend the utility of demographic products by linking information from consumer surveys on the characteristics of purchasers of various product lines to localities where potential consumers with those characteristics live. Sales potential information is marketed to retailers, shopping center developers, and leasing agents, all of whom would like to know how many dollars' worth of sales can be made at a given site. When merged with sales data, data systems which deliver census-type data for any area of the country can also deliver retail sales potential estimates by product line.

The major source of data for retail site potential measures firms is consumer surveys. The U.S. Bureau of Labor Statistics collects data regularly through its Consumer Expenditure Survey (CES). A major CES was taken in 1972-73, and annual surveys have been undertaken

42. How many pounds of margarine have you purchased in the past month?
1. Under 1 2. 1-3 3. 3+ 4. None

43. Which brand(s) of margarine have you (A) purchased most often, (B) purchased in the past year?

	A)Most Often	B)Past Year
Blue Bonnet	1.	1.
Fleischmann's	2.	2.
Fleischmann's Light	3.	3.
Imperial	4.	4.
Mazola	5.	5.
Parkay	6.	6.
Promise	7.	7.
Saffola	8.	8.
Shedd's Country Crock	9.	9.
All Others	0.	0.

44. What are the occupations of the adults in your home?

	You	Spouse
Blue Collar Worker	01.	21.
Business Owner	02.	22.
Craftsman/Tradesman	03.	23.
Executive Upper Mgmt	04.	24.
Homemaker	05.	25.
Middle Management	06.	26.
Nurse	07.	27.
Office/White Collar Worker	08.	28.
Professional (degreed)	09.	29.
Retired	10.	30.
Salesperson	11.	31.
Teacher/Educator	12.	32.

45. Which brand(s) of liquid foundation do the female members of your household use and how frequently is it applied?

46. Do not use	Times Per Week 5-7	3-4	2 or less
Clinique Brands			
Balanced Make-up	01.	21.	41.
Pore Minimizer	02.	22.	42.
Cover Girl Brands			
Clean Make-up	03.	23.	43.
Moisture Wear	04.	24.	44.
Oil Control	05.	25.	45.
Este'e Lauder Brands			
Polished Performance	06.	26.	46.
Fresh Air Make-up	07.	27.	47.
L'Oreal Visuelle	08.	28.	48.
Maybelline Brands			
Shine Free Oil Control	09.	29.	49.
Long Wearing Makeup	10.	30.	50.
Revlon Touch & Glow	11.	31.	51.
Natural Wonder Shine Stopper	12.	32.	52.
Other Brands			
Moisturizing Formula	13.	33.	53.
Oil Control Formula	14.	34.	54.
Regular Formula	15.	35.	55.

47. Does anyone in your household own?

1.	Compact Disk Player	5.	Powerboat
2.	Dishwasher	6.	Sailboat
3.	Microwave	7.	Vacation Home
4.	Mobile Phone	8.	VCR

Sample from a National Shoppers' Survey.

since 1980, primarily to update the cost-of-living indices. Syndicated surveys such as those taken by media survey firms (MRI, Mediamark Research Inc. or SMRB, Simmons Market Research Bureau) represent another source of consumer information. A third source is industry-specific surveys, such as the Gallup Eating-Out Survey, surveys of sports and recreation purchases, and surveys of automotive parts purchases.

In the evaluation of the survey data, analysts should find out the date of the survey, how frequently it is taken, how representative the sample is, and how much respondents had to do in the survey. A complete copy of all the questions asked should be obtained—not just the questions that apply to one product. With the whole survey in hand, the exact sequence of questions can be ascertained, and an assessment made of the likelihood of a high-quality response.

The methods used to combine demographics and consumer purchasing data vary from firm to firm, and even within one firm's retail potential products. They may be based on regression analysis, geodemographic segmentation, on segmentation by age or income, or some combination of these. Regression-based analysis of survey data on individual consumers provides coefficients to predict consumption of doughnuts, for example, by examining age, sex, income, and occupation of the respondent. Retail potential based on geodemographic segmentation system methods is fairly straightforward. The addresses of syndicated consumer surveys respondents are known, particularly if it is a mail-out/mail-back survey. Those addresses are geocoded to the appropriate BG/ED, and then assigned the cluster code for that BG/ED. It is then a simple matter to calculate the doughnut-purchase-likelihood of households within each cluster type. When a trade area is defined, the geodemographic composition is determined, and each cluster type found in the trade area is multiplied by the appropriate doughnut consumption rate as shown by the survey. Potential consumption calculations based on age-sex segments or income segments work in the same way—doughnut consumption by age or income is tabulated from the survey and merged with trade area demographics.

The main assumption of all these methods is that the residents of a given trade area will behave in the same way as survey respondents. This may not always be the case, since local tastes, conditions, and motivations may not be the same as a national or regional average. One might end up predicting great demand for snow tires in Florida if national, or even regional, rates were applied.

Retail potential is just that—potential. It is an estimate of what the people who live in an area *might* buy if they behaved like the survey respondents. It pays no attention to any of the key real estate questions such as competition, traffic, access, ingress, egress, or to effects of advertising and marketing, management effectiveness, store maturation cycles, and all the other factors which determine sales. Such models also cannot evaluate the effects of daytime population, a group population for which only the scantiest data are available.

All the data discussed in this section are secondary data that need to be adjusted, analyzed, and adapted to new needs arising after the data were collected. As such, they will never be perfect—but neither are primary data perfect. In general, secondary data should be the first data sought out in a study; they provide valuable general direction for decisions and investment planning, but should not be the final basis for those moves. While a drive down Main Street is not a substitute for an accurate demographic profile, it is essential to confirm secondary information firsthand. As the examples in the next section will show, effective use of demographic data products requires an understanding of both the demographics and the nonquantitative dimensions of the real-world situations they describe.

Site Analysis Process

Demographics provide a gold mine of information for managers trying to decide upon a location. If the chacteristics of the consumer are known, demographics can help find them. Site analysis with demographics varies according to whether one site or multiple sites are to be chosen. For the manager who has to decide on 25 sites, hundreds of potential sites should be analyzed. Of those hundreds, there might be 200 good prospects and 100 very good prospects that would warrant further research.

Take the case of a discount book chain that markets hardcover best sellers, travel and self-help guides, cookbooks, and a selected list of paperback fiction, mysteries, and magazines. The first step is to ascertain who buys books and magazines—not everybody reads, and not all readers buy books, so who is the customer? This could involve focus groups or surveys, or it could just involve secondary research, since the market is fairly well defined already. There are many articles on the book-buying public, as well as the possibility that some syndicated surveys may have already asked questions related to books and magazines. Book buyers can probably be profiled by their age, income, occupation, or educational level. The market probably consists of adults with middle-to-upper incomes and relatively high education—some college at least. Given such a profile, the analyst needs to search out the markets where these people are located.

One question that comes up when locating consumers of any product is the extent to which purchases are made during leisure hours, in which case residential location is likely to be a more valid indicator of where purchases are made. Differentiation of purchasers by gender is also important, since women tend to make more purchases at locations close to their residences. In making a first cut at several hundred potential locations for outlets, the readily available demographics are the only data it makes economic or time-use sense to analyze. From either published census data or the systems of commercial demographic firms (here it would be worth considering whether to purchase the site potential data described earlier), trade area profiles can be constructed. These profiles might include the total number of people and households in the potential trade area, their age, income, and education distributions, and even the relative propensity to consume various goods and services related to the book and magazine market, the retail potential reports described earlier. At this point in the site-screening process, all that needs to be done is a relatively straightforward rank-ordering of site potential from high to low.

This ranking can be approached in two ways. The simple way is to compile counts of prime target groups at each site by age, income, and education and total them up. A more detailed approach might be to weight each variable according to its importance to book and magazine consumption. A typical weight is a conversion of household income counts into the number of adults in each income category—a simple multiplication by average household size should suffice. Rather than just focusing on the primary consumers, another approach would be to look at the purchasing habits of every group. If survey data can reveal what percent of people of every age group buy books, then take these "age-specific book consumption rates" and apply them to the whole age structure, thereby estimating total book demand. The same could be done with the income and education distributions, and an average taken to arrive at bookstore site potential. Since such estimates result from the application of secondary information to the local area, they are not going to be an exact absolute measure of demand, but they will provide a relative measure which can be applied readily to each site. The results indicate dollar volume of book sales at each site, total customers, and the percent of people in the trade area who are likely to buy. Ranking these

measures provides a guide to which 200 sites have enough potential to warrant further analysis.

The next step should involve collection of more detailed site-related data, but not yet making site visits. Information sought includes local government policies, planning or zoning estimates of households, and growth and anticipated growth in the trade area. This is an important local verification of the information generated about post-census growth estimated for areas by a data vendor. Real estate information pertaining to location, access, traffic, and the overall balance of potential sales relative to costs (or as some practitioners say, "financials") should also be incorporated, as well as some measure of competitive presence. In this case much of the "primary" data apply to the real estate rather than consumers.

Some sites would be dropped at this stage: those where the population estimates are questionable, those where the financials do not work at all, and those where access or traffic are problematic. The next stage involves intensive financial and site work, and should incorporate site visits and collection of as much information as possible on the local area, possibly even including small local phone surveys to assess demand. This is the stage which determines which real estate deals should be sought.

What the demographics and other secondary data will tell the analyst is which potential store locations to investigate further. They cannot tell the analyst whether to open a store in a given location. This can only be the result of intensive analysis of an area's characteristics, the quality of the real estate, and whether the financials work.

Can the demographics "tip the balance" in one direction or another for a build/no-build decision? Here the answer is definitely *no*. There is a significant margin of error, first in the estimate of the number of people who live in the trade area (unless a census was just taken), and second, in the rate at which they are likely to patronize bookstores. Thus, the demographics can tell the analyst which markets have very high and very low potential, but middle-ground estimates must be firmly supported by all the other factors involved before a decision to build or lease is made. Errors of 10 percent or more in small-area demographics are standard, and demographics are only one part of the puzzle.

After sites are chosen and the stores opened, the evaluation process should start immediately. Which stores have high sales, and which have low? How do they compare with the population which was projected to buy? Should more stores be opened to lock-out the competition? All these questions are addressed with sales data combined with demographics. As the chain of stores starts to generate clear sales patterns, more detailed models can be constructed which may predict store performance in a wide range of circumstances using detailed multivariate models. However, until there is a substantial base of stores to work from, the direct rate and ratio techniques described here are the best alternatives.

Site location analysis is not limited to merchandising. The case study on Bell Atlantic's strategy in the Washington, D.C. area (see page 41) illustrates how demographic information was used to locate a service, in this instance the distribution of agencies for people who want to pay their phone bill personally rather than by mail. Decisions about the location of manufacturing sites (or in the General Motors case study on page 39, determining the implications of closing down a site) can also draw valuable information from the analysis of the demographics.

Product Planning

The consumer demand side of product planning can be applied to new or existing products; the difference being that new products present special problems in primary research. Consider a supermarket chain manager deciding whether

to create a line of gourmet dinner entrees for its delicatessen department. Again the potential consumer needs to be carefully defined. Gourmet entrees are likely to appeal to higher income, two-earner couples who prefer restaurant quality food and would like to eat at home but don't have the time to prepare such meals. For many product categories, and even individual brands, there are periodic syndicated surveys which indicate who is buying specific products. These surveys can be retabulated to reveal purchase patterns for detailed segments of the population.

Calculating sales per household nationally is a fairly direct process. No survey is needed, just a division of total units sold by total households. This is a crude consumption rate. As a next step in identifying the customer, a tabulation of consumption by age could be done for each age group, creating age-specific consumption rates for each age group, 18-24, 25-29, 30-34, and so on. This can be taken a step further by looking at age by sex or age by income groups. In either case, the raw materials for immediate and long-term consumer demand planning have now been created.

The other information needed is a population base to discover all potential consumers. Population projections for the United States and individual states are readily available from the Census Bureau and state data centers. These projections show age and sex distributions from 1980 to 2020 or even 2050. It is a simple matter to take the age-specific product consumption rates and apply them to the age structures projected for 1990, 1995, and 2000. This results in a projection of total gourmet-deli entree consumption for those years, if the population projections hold, and if gourmet food consumption remains the same.

While the validity of national and state population projections is beyond the scope of most planning activities, the other assumption requires reflection. First, what is the shape of the market right now? If high total sales of these entrees are due to high consumption rates by convenience-conscious 20-34 year olds, then maybe the boom in consumption is being driven by an "age" effect: baby boomers occupy all of this age group, and the large size of their generation may be causing the apparently high rate of consumption. If present consumption rates are the whole story of gourmet-deli entree consumption, then those entering the market should use extreme caution, since the number of 20-34 year olds will be dropping precipitously over the next ten years.

Second, what will be the shape of the market in the future? Again, a consideration of life cycle patterns should be made, but focusing on whether habits or tastes acquired now will be continued as consumers age. Are today's 20-34 year olds going to eat more gourmet-deli entrees ten years from now when they are 30-44? Consumers in their 30s and 40s are more likely to have children who create competing demands for family income, thereby reducing the amount available for gourmet foods; they may also be more conscious of their diet and their health. At the same time, the two-earner lifestyle with its demands on time and higher income that baby boomers have made the norm could increase the demand for up-scale convenience foods even more, perhaps with a diet-consciousness that would suggest expanding the line to include low-calorie, low-salt, and low-cholesterol menus.

Entree consumption rates could also be viewed as the result of contextual, historic, or "period" effects. Taking this perspective, it may be that the whole idea of consuming gourmet-deli entrees is one resulting from a unique combination of influences which were current as the business was being established. Thus, a segment of today's young adults may be the only group that will ever consider consuming such entrees. Factors which combine to create that taste could derive from any number of social influences, including advertising, fashion, and even unique effects generated by the baby boomers themselves—any and all of which may or may not persist as influences on coming generations. From this perspective, the whole product category of up-scale con-

venience entrees could wane, and the people who now consume them may shift to other products. Holding age-specific consumption rates constant for future generations may not be prudent.

These different constructions of even a limited range of consumer attitudes, tastes, and behaviors show the dilemma: which set of rates should be used for long-term market planning? The answer is simple, however: use them all! Each set represents a different scenario that should be played out for its market implications. The result will be a range of likely outcomes; the consumer attitudes which contribute to the likelihood of each scenario proving reliable should be explored thoroughly. It is also clear that interactions of the three effects are possible—products created in response to unique demands of the baby-boom generation may well enter the general consumer marketplace as essential to the conduct of life for future generations.

Whether the attitudes and behavior leading a given model of consumption might apply in the future can be explored with both secondary and primary data. Secondary data dealing with dietary behavior and attitudes are available from the U.S. Department of Agriculture and many commercial sources. Primary data to address the remaining questions could be collected on several key demographic groups. Understanding collective consumer decisions which are behind total gourmet-deli entree consumption will help to determine which rates and models to apply.

The analysis so far has assumed that there is some degree of product history and tracking in consumer surveys. If there are no survey data on a product, then analog products should be isolated. In the case of gourmet-deli entrees, the analog could have been the up-scale frozen entrees that have been on the market for a few years. Lacking even an analog product, primary research should be undertaken, such as surveys or test marketing programs. These should include substantial demographics, because demographics are the only way to generalize the results to a broader population.

Decisions such as these require demographic experience, judgment, and skills. This raises the question to which the next section is addressed.

Who Does Demographics?

The advantage offered by the demographic data industry is data, lots of data, and the ability to assemble data readily for any customized geographic area. The industry's strong point is data, not interpretation.

And interpretation is essential for the effective use of demographic information. Unless users understand how the information will help solve a management problem or guide a decision process, they are likely to end up holding a very expensive pile of computer printouts or floppy disks. The other variable in the demographics equation is the people who help managers to see how demographic information can help in problem solving and decision making, advise them on the costs and quality of data products that are available, and do the analytical work necessary to use data effectively. An important contribution a demographer can make is in deciding what kind of information is needed for a given decision situation, which requires an understanding of the psychology of consumer behavior, consumer economics, and market research in addition to demography.

Who are these people and where does one find them? Some, actually a minority, are demographers. Others are market researchers, statisticians, planners, and administrators. A few have had formal training in demographic methods, but a great many have had to learn on the job or by attending short specialized courses such as those sponsored by the Census Bureau and the American Demographics Institute. Most trained demographers are involved in research, teaching, and data

gathering in universities, statistical agencies like the Census Bureau, and think tanks. A significant number work in government, applying demographic information to the design, implementation, and evaluation of public programs and policies. Very few are found in the business sector, though the number has increased because of the growing interest in demographics in recent years. But the majority of people who do demographics have come to it from fields other than demography.

This was shown in a survey by *American Demographics* magazine, reported in the August 1983 issue, of demographers in the private sector. The sample included subscribers working in *Fortune* magazine's top-100 companies and Population Association of America members interested in business demography. The survey found people working with demographic data and doing demographic analysis in a wide range of positions and organizations; while they were well educated and knowledgeable about demographic data and methods, only 39 percent had taken even a single course in demography. The dominant educational background of the sample was business. Respondents with formal training in demography were more likely to be found in administrative, planning, and research positions, while those without such training tended to be in marketing and market research.

Private sector demographers, whether formally trained or self-taught, are involved in an increasingly broad range of activities in a variety of settings. Some are employed in the growing number of organizations specializing in demographics products and services, including consulting services, survey research, mapping and graphics, mailing lists, specialized data analyses and software development. A September 1987 *American Demographics* directory of these organizations revealed almost 100 who identified themselves as being in the demographics business, ranging from subsidiaries of large corporations to individual consultants.

Demographers are increasingly found in other parts of the corporate sector, including a number of important manufacturers as well as banking and financial services, real estate, communications, transportation, power companies, hospitals and health care providers, as well as in retail sales, from shopping malls and mail-order houses to delicatessens. Demographers are also working on applications of demographics for the management of unions, trade associations, and nonprofit organizations, and in the business offices of colleges and universities.

While businesses have gotten very interested in demographics, they still haven't quite figured out just what to do with demographers. Most corporations rely either on their market research or strategic planning departments for demographic information when they need it, and this is where one finds the occasional business demographer. Interestingly, many of these demographers report that they got their positions through the back door, on the basis of credentials in survey research, statistics, or computer skills rather than demography. It was only after they established themselves and worked hard at educating their colleagues and supervisors on what a demographer could contribute that they could usefully identify themselves as demographers. The scope of these contributions is increasing all the time, as businesses increase their awareness of the benefits of demographics.

Much more than in academic and research settings, business demographers find themselves combining the application of demographic data and methods with a variety of other activities, with demography often taking a back seat in the process. Occasionally, though, a demographic concept or methodological approach will provide a new insight or solution. This happened when demographers at General Motors adapted a method called "multiple decrement life tables," which were developed to track the impact of various types of diseases on mortality in the human popu-

lation, to estimate the costs of maintaining warranties relative to the likelihood that a particular automobile part would fail in a model-year population. The telephone company case study on page 41 shows how a demographic technique used in apportionment of congressional seats—which was the reason why the government started taking the census in the first place—was used to allocate agents collecting phone-bill payments.

Demographers working in the corporate sector face a different set of challenges than those in the more traditional academic and research-oriented career paths. The expectations and reward system are fundamentally different. The demographer in business has to understand business problems and how information is used by management. Decision makers want definite answers based on the latest information; they don't want to hear about the assumptions and limitations of the data. A trained demographer whose first instinct is to scrutinize data and assumptions may be uncomfortable in situations where the only way to get something done is to adapt, approximate, and improvise—and do it quickly.

The geographic detail of demographic information demands more skill and attention from demographers in business and applied settings than in academic and research settings. Many of the tasks that have been described require information to be compiled and analyzed for specific localities and smaller areas, so that the business demographer has to know census geography and be able to link it to other types of geographic units such as market areas, service districts, and the multiplicity of local administrative units into which the country has been divided. This requires data management and computer skills to compile and present the information, and the statistical expertise to know how to derive reliable information from sample data.

Organizations considering whether to hire a demographer as well as individuals considering careers in business and applied demography often wonder what to look for in terms of training, skills, and experience. Most demographic training is oriented to teaching and research, though a few programs are now being geared to applied and business applications. Traditional training in demography emphasizes demographic methods, statistics and research methodology, and theories and research findings about the determinants and consequences of demographic variables such as U.S. and international population growth trends and patterns of fertility, mortality, and migration. Business demographers also need to know these demographic and statistical methods, though with greater emphasis on the techniques used in business and public administration. They should also be aware of important theories and research findings more as a matter of basic demographic literacy than because there will be many opportunities for their practical application.

If past trends are any guide, many who work in demographics in business and public administration will not have had the opportunity to complete a degree program in demography or even to have taken a course or two in the field. Fortunately, interest in demographics has opened the door to demographic topics and methods in the curricula of schools of business and public administration, and one now often finds them listed in syllabuses and in textbook indices. Short courses and training institutes are another option for individuals interested in acquiring more information about demographics and methods for working with demographic data.

Demographics and Other Management Tools

Demographics is a field whose practitioners are almost always combining demographic data and methodology with

work in other disciplines. Indeed, demographics are most effective when combined with other data to address business or policy decisions. We've seen how census data can provide a wealth of information for market research on the demographic and socioeconomic characteristics of people living in a specific geographic area, and can be used to locate areas having a high proportion of households with a given set of characteristics. Such data become even more valuable when linked to market surveys that indicate which kinds of goods and services are more likely to be purchased by people with different education and income levels, younger and older people, males and females, and so on. Specialized psychographic surveys aimed at identifying consumer attitudes and the personality traits and lifestyles that characterize particular groups (for example, VALS, the Values and Lifestyles analysis developed by SRI International) have been used to guide product development, advertising, and development of sales strategies. Psychographic information focuses on behavioral traits and demographics on socioeconomic and geographic characteristics, and advocates of psychographics point out that attitude and behavior can vary among consumers in a given demographic category. Nonetheless, there is typically a high degree of association between the two, which enables analysts to get considerably more mileage by using both in the effort to locate and target potential consumers. The cluster-demographics described earlier rely on this; for example, the categories in Donnelley Marketing's ClusterPlus product are labelled with terms that suggest lifestyle differences, and a search for clusters in an electronic data base is considerably less expensive than conducting a lifestyle survey.

Similar bridging to different fields occurs in other applied demographic activities. Site search and plant location work combines demography with geography, knowledge of zoning laws and tax structures, regional economics, and engineering—not to mention public relations and a sense of how local politics function. Forensic work demands an understanding of the relevant civil and criminal codes, legal processes, plus labor and consumer economics as well as demography. Planning applications require familiarity with various types of modeling as well as an understanding of accounting and budgeting processes.

What the Future Holds

The information revolution is still unfolding, and advances in data storage, retrieval, and communication are creating ever-expanding horizons. Microcomputer developments during the 1980s are changing the way everyone works, and have had a profound effect on the information business. Fiber optics promise faster and more accurate telecommunication of data. Tasks that once required mainframe computers are now within the capability of desktop machines.

New generations of personal computers offer faster processing, large internal memory, and vastly expanded peripheral memory capacity. When an earlier PRB *Bulletin* on business demographics was published in 1984, the news was that data were becoming available on floppy disks holding 360 kilobytes of information. Today compact laser disks are available that hold 500 megabytes of information (the equivalent of several high density computer tapes), and projections are now being made in terms of gigabyte capacity that can be accessed on a PC. Technological advances are also making possible more effective visual representation of information, using high resolution color graphics, projection devices, and transfer of graphics to print and other media.

While technology has played and will continue to play an important role in

shaping the information revolution and in demographics, demographic trends are also major factors in shaping the future. Knowing the demographics of the market for products and services increases profits and efficiency, and creates an important ability to anticipate trends and plan for the evolution of a product. Getting the information and data is an important step; the crucial activity at all times is interpretation. □

Case Studies

Demographic Analysis in a GM Modernization Program

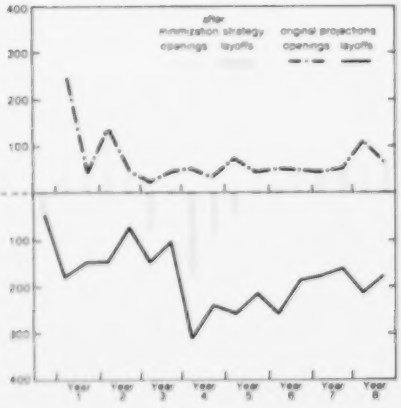
Demographers are accustomed to studying the dynamics of populations defined by political boundaries, whether national, state, or local; demography can also, however, provide valuable insights when applied to the dynamics of an organizational population, such as the work force of a large corporation, and even an individual facility within a corporation. This is illustrated by an experience of the General Motors Corporation.

In 1984, one of GM's divisions submitted a multi-million dollar appropriation request to the Corporation to modernize one of its operations affecting 12 midwestern plants. Since the modernization involved the acquisition of equipment that would raise productivity, at least three facilities would be closed. In addition to preventing overcapacity, these closures would increase general operating efficiency and lower costs.

Both the closures and the modernization of the remaining plants meant a significant reduction in the number of hourly-paid employees required. At the same time, divisional management was seeking changes in local union agreements regarding work rules in order to enhance equipment uptime, again reducing labor needs and increasing the number of layoffs of hourly workers. Under the National Agreement between GM and the United Automobile Workers of America, laidoff employees receive Supplemental Unemployment Benefits. A laidoff employee with more than 15 years seniority would receive 50-75 percent of his income until retirement or recall, while in the event of a plant closing, workers would become eligible for the Guaranteed Income Stream benefits with just ten years of seniority. The Corporation thus faced significant liability in the form of employee benefits that would have diminished the cost savings of the proposed modernization.

When this appropriation request was initially discussed with the suitable Corporate decision-making committee, action was delayed, and the division was

Before and After Demographic Analysis



Note: All data are illustrative, but reflect the results of the actual analysis.

requested to prepare a human resources plan to assess and then minimize the adverse impact. UAW leaders, in preliminary discussions about the proposal, had been negative as well.

At this point, GM's Corporate Industrial Relations Staff was asked to assist the division in developing a more accurate assessment of the anticipated layoffs and to identify alternative strategies for minimizing liability costs. Each facility had already projected the number of hourly employees by skill group that would be needed after modernization and had compared their projections to current work force levels. In some cases, plant management had also looked at historical attrition rates to identify ways to compensate for anticipated layoffs.

The first step was to analyze each plant's current hourly-paid work force using standard demographic techniques, and to project future employment under several "what if" scenarios. A computer model was used to simulate worker flows to and from plant populations according to contract provisions governing layoffs, recalls, retirement, etc. The analysis revealed that, while the overall layoff process could last eight years, it would not involve the same employees at every point in time. The projected average length of time on layoff was 12 months for skilled workers and 16 months for nonskilled employees.

The analysis showed that while some plants would be laying off employees during the modernization at their locations, others would be hiring to offset their increased production. More significantly, the simulation revealed that some plants would be hiring in one time period and then laying off the same employees in the following periods. In short, there was an allocation problem; a mismatch between work force supply and demand.

Using the simulation analysis, managers at individual plants were able to identify alternative strategies to minimize both the human impact and the economic liability. Analysis of the dynamics of plant population change showed how it would be possible to make more efficient use of attritional losses to reduce the work force over a period of time instead of laying off significant numbers. By extending the modernization work schedule at certain plants, peak employment demands and the need for new hires were reduced. Another option developed was subcontracting some of the work during peak periods in order to avoid hiring people who would subsequently have to be laid off. Several facilities also discovered that they needed to refocus their skilled-trades training on those specialties that would be in short supply after modernization and immediately terminate training programs for those trades where layoffs were projected. In some cases, retraining of about-to-be-made-redundant employees was possible.

The study also made clear that minimization of layoffs and their associated costs could not be achieved by aggressive management strategies at individual plants: it would be necessary to coordinate and implement strategies *across* the 12 plants. One possibility suggested by the "what if" simulations was to transfer, on a temporary basis, excess employees. By redistributing the work force and reducing the need for new hires, the number of anticipated layoffs could be considerably reduced. The analysis made it possible to demonstrate the advantages of this strategy to the UAW and gain the union's support for a special agreement to allow cross-area transfers.

The complete closure of 3 of the 12 facilities presented a different problem since layoffs would be permanent and few opportunities for recall to other area GM plants were projected. About 41 percent of the work force had 25 or more years' seniority, 33 percent were expected to have 10-25 years, and only 25 percent less than 10 years' seniority. This suggested that the division consider different human resource policies based on seniority—for example, early retirement for those with high seniority, retraining and transfer for those employees with middle-seniority (especially those in skilled trades ex-

pected to be in demand), and special separation incentives and external placement assistance for employees with lower seniority.

The application of demographic analysis demonstrated that the employment impact of the proposed modernization could be minimized through aggressive coordinated management, significantly reducing costs to the Corporation, and enhancing union cooperation. The analytical results contributed importantly to approval of the division's proposal by top management and subsequent discussions with union leaders.

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Payment Agency Placement Strategy

"Representatives shall be apportioned among the several States which may be included within this Union according to their respective numbers," says the U.S. Constitution of 1787. The redistribution of House seats following the decennial census is determined according to a method called "equal proportions," in which each state's population is used to find the number of seats it will be allotted in the U.S. House of Representatives. A similar technique has been used by the telephone company to distribute payment agents in telephone exchange areas.

Telephone company customers have three options for paying their monthly phone bills: 1) payment by mail; 2) payment at a company location; and 3) payment through a third party. The third party is an agent authorized by the telephone company to collect payment. The agents are often banks, but in remote locations the agent may be a country store.

In the early 1980s, the Chesapeake and Potomac (C & P) Telephone Company of Maryland re-evaluated its system of payment through agents. Two conclusions were reached: 1) payment agents created an expense not incurred when customers used mail service because each payment collected by an agent led to a remuneration fee; and 2) the telephone company cash flow or "float" was affected because payments collected by an agent were often not immediately forwarded to the company.

Bell of Pennsylvania

Payment agent electronically processing a telephone bill.

Operating expenses are ultimately paid for by all telephone customers, so containing expenses associated with payment agents became a target of major concern. On the other hand, many poor and elderly people found paying their bills through a payment agent convenient and less expensive than other methods of payment. Continuing to serve

Stratification Algorithm

Each exchange is processed through the following screens:

(A) Density Screen	Assigns x% agents for each unit of 1,000 population per square mile. (There is a ceiling.)
(B) Income Screen	If zero agents assigned in Box A, assign 1 agent if the percent of households in poverty is greater than or equal to y%.
(C) Age Screen	If zero agents assigned in boxes A + B, assign 1 agent if the percent of household heads 65 + is greater than or equal to y%.
Metro Screen	If Metro and zero agents assigned in boxes A + B + C, and the number of business lines exceeds T, assign 1 agent (daytime population)

If non-metro and a census designed "urban" place exists in the exchange, assign 1 agent, if no assignments were made in boxes A + B + C

customers was also of great concern. The issue for the Maryland company was one of balancing these conflicting needs.

Because the problem would eventually be addressed in the District of Columbia, Virginia, and West Virginia as well, the C&P companies established an Interdepartmental Payment Agent Committee (PAC) with representatives from the various Treasury, Residence Services Billing and Collection, Public Relations, and Data Processing organizations. The PAC soon concluded that the payment agent structure in the Maryland company was indeed overgrown and outmoded. Treasury representatives wanted the structure to be rationalized to include only agents with electronic capability to transfer funds. This approach would offset payment agent costs because the payments would reach C & P accounts even sooner than if they had been mailed. Residence Services and Public Relations were concerned with the opinions of the state regulators, customers, and stockholders. On the one hand, elimination of agents who had established ties with the public seemed risky. On the other hand, reduced costs spelled lower rates. Data Processing was concerned with the procedural issues, the time and expense involved in setting up a new system. At this point, the committee asked C & P's demographer to examine the problem and develop a fair and equitable way of balancing the conflicting interests.

The solution involved the use of a variant of the technique used to apportion representatives to the U.S. Congress, as well as state and local assemblies. A total fixed number of available payment agents was based on the total number of households in the part of Maryland served by a Bell Atlantic telephone company. Agents were then distributed according to the density of households in each of the company-served telephone exchanges. Additional consideration was given to rural areas and exchanges with disproportionate numbers of the poor and the elderly. The demographic unit had developed an on-line demographic data retrieval system which included census data and information from other sources that was used to profile each of the exchanges. It was possible, using the demographic criteria and a screening algorithm (shown in the diagram), to assign each telephone exchange a proposed number of agents. This approach is similar to the one used for Congressional apportionment among the states.

Treasury was pleased because the total number of agents derived on the basis of

demographics was far less than the number in service at the time. Additionally, the major factor in the distribution of agents was population density, and the banks with the most advanced electronic fund-transfer features tended to be located in the more densely settled telephone exchange areas. Residence Service and Public Relations were pleased because the method of allocating agents was fair, and the poor, the elderly, and those living in rural areas were covered. The stockholders and the customers bearing the burden of the costs were also winners in the process. And, very important, Maryland's state public utility commission accepted the solution.

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Determining the Demographics of a Market Area

Located in the northeast section of Omaha, Nebraska, Country Mart is an 18,000-square foot grocery store, which offers free cash checking, film developing, postage stamps, money orders, deli service, and local bus tickets in addition to the standard array of grocery goods. Wilbur Fast bought the store in 1982 and sales have been reasonably strong since then.

Louis Pol

Country Mart, Omaha, Nebraska

However, by 1986 Mr. Fast was concerned that his market area might have shrunk compared to the early 1980s. He also wanted more information on the demographics of the area in order to serve his customers better, as well as advice on sales promotion, advertising, and store image. He contacted the Nebraska Business Development Center which, with funding from the state of Nebraska and the U.S. Small Business Administration, provides free consulting assistance to small businesses. The case was passed to the author, and two marketing research students, David Shavlik and James Corson, performed the analyses under my supervision.

A consultant hired by Mr. Fast when he bought the store in 1982 determined its market area at the time by plotting the addresses of check-paying customers on a map. We used the same approach to ensure comparability, although in other such cases we have included addresses of cash-paying customers obtained through interviews with customers as they leave a store. An ongoing survey of actual and potential customers would be the most direct way to obtain both demographic and sales data, but most businesses have neither the time nor funds for this type of activity. The addresses we used came from a photocopied sample of checks collected from Mr. Fast over a seven-day period.

Our plotting indicated that more than 90 percent of the store's current check-paying customers lived in three zip code areas. The market area could have been defined by more detailed geographic boundaries, such as mail carrier routes or census tracts or blocks, but the addresses were well dispersed throughout each of the zip codes and this warranted their use. Comparing these results with those of 1982 indicated that the store's market area had actually expanded to

the north during the ensuing four-year period.

The next step was to compare data for these three zip code areas, obtained from the 1980 Census of Population and Housing, with the most recent and detailed intercensal estimates available for the same areas. From a number of data vendors, we chose estimates derived from the local *Omaha World Herald Consumer Preference Study*. In addition to demographic estimates, this study generates data on local store preference, buying power, and newspaper readership which we wanted to use in other parts of our analysis. The *Consumer Preference Study* demographic estimates tallied quite well with independent estimates from CACI, Inc. However, there were some differences so we urged Mr. Fast to be cautious in interpreting the figures.

The 1986 estimates shown in the Table along with 1980 census data indicate that while Mr. Fast's market area had not lost population since 1980, the number of residents had also not increased. A comparison of similar data for the store's market area as of 1982 revealed a decline in both household numbers and population. In the three zip codes of the current market area, the number of households increased by an estimated 636 between 1980 and 1986, while other demographic indicators remained about the same. The median home value had gone up by 28 percent, more than the 21 percent increase in the total Omaha, Nebraska MSA.

We advised Mr. Fast that he could be successful with the stepped-up promotion campaign he planned, since his market area and thus potential customers had grown while the number of competitors had not. We recommended that he continue to monitor his market area for shifts in boundaries and in demographic characteristics that could indicate changes in his actual and potential customer base. Important among these would be household structure changes and population aging, factors which are linked to where and how often people purchase food and other grocery items.

Country Mart 1986 Market Area; Selected Demographic Characteristics: 1980 and 1986

Characteristic	1980 Census data	1986 estimates
Population	56,028	56,100
Households	20,074	20,710
Percent college graduates	40	40
Median household size	2.4	2.4
Percent owning home	76	79
Percent of households with children under 18	47	45
Median home value	$36,944	$47,439

Note: 1986 market area covers three zip codes.

Although we were able to document that Mr. Fast's market area had expanded, he was limited in his access to existing and potential customers by a lower-than-average penetration of newspaper advertising in the area. We recommended alternative approaches, such as direct mail and outdoor advertising. These can be targeted to areas much smaller than zip codes and thus are likely to reach actual and potential customers more effectively.

We warned Mr. Fast that any conclusions drawn from our analysis were based only on identification and description of his entire market area, including both customers and noncustomers. This is a disadvantage of a non-survey approach to identifying market areas. However, learning more about the areas where present customers live should give a useful idea of size and characteristics of the potential market.

Mr. Fast followed the advertising recommendations. He relied heavily on fliers mailed to residences in his target market and has expanded his direct mail strategy to include individual professionals and

businesses which might be interested in his deli service. Fliers were also utilized to advertise his food services to local churches. Finally, he had become a retail sponsor to two local schools, making his store more visible in the community.

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Pitfalls and Pratfalls: Hazards in Secondary Data

The practical, economical, and appropriate applications of secondary data are emphasized in this *Bulletin*. However, there are situations in which an apparently valid combination of secondary data sets, each of which has internal consistency and validity, create hazards. These hazards can be ameliorated by careful reflection upon the goals of the project and the character of the data, as well as by crosschecking the consistency of results with other sources of information. This case illustrates the point.

A client of Market Statistics, Inc. requested an estimate of the number of practicing physicians in U.S. counties. Market Statistics reviewed the available data and decided to employ the following standard sources:

1. The National Occupational Employment Statistics (OES) Survey data on occupation by industry (including the occupational listing: physician in the hospital industry) in 1984;
2. U.S. Census County Business Patterns data by industry (including hospital industry employee totals) for 1984;
3. The New York State Medical Directory showing hospital physicians by name and specialty for 1984-85.

The procedure appeared to be straightforward: multiply the percentage of physicians in the hospital labor force from the OES Survey by the total number of hospital employees in each county from County Business Patterns. Linking information from a national survey to county-based data in order to break down the total hospital labor force into physician and other components is a common approach.

Careful checking of the results revealed some important flaws. The results for Cayuga County, New York, are illustrative. The percent of the hospital labor force who are physicians in the OES Survey is 2.46. Cayuga County has only one hospital, Auburn Memorial, with the number of hospital employees based on the midpoint of the range reported in County Business Patterns being 622. Carrying out the multiplication procedure yielded 16 doctors in Cayuga County hospitals, which appeared to be consistent with estimates of doctors in hospitals by county throughout the United States. The client had a quick and seemingly authoritative estimate of hospital-based physicians throughout the country.

In this case, however, the reasonable approach yielded a spurious conclusion, discovered by Market Statistics when they verified the results against independent information. Since Cayuga County had only one hospital, the check was quite direct. They compared the Cayuga County estimate with the Medical Directory of New York listing for Auburn Memorial Hospital, which showed 90 doctors in practice. Why was there such a difference?

The reasons lay in their underlying data, the definitions, and the procedures used in tabulations. In the OES Survey, the physicians classified as practicing in hospitals were limited to those physicians who worked *only* in hospitals. Thus, the hospital-physician data were artificially deflated, and the ratio of physicians to other hospital workers was too low.

Secondary data are just that—secondary. Rules, definitions, and procedures used in collecting data are established to serve a particular purpose, and that pur-

pose may or may not complement the goals of those who reuse data. Indeed, even primary data collected for a project may fail to address research questions directly. When an estimate of a market or population is calculated, it is important to check out the validity of the data and methods. Data collection procedures must be examined for their implications, and definitions understood. Computational methods should be re-examined and compared with alternatives, and results tested against independent sources. Every method will yield somewhat inconsistent estimates, but substantial differences are a definite indicator of problems like the one uncovered by Market Statistics.

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